MOTOROLA

MTM5400
TETRA Mobile Terminal
Installation Manual

When printed by Motorola

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IMPORTANT SAFETY INFORMATION

Icon Conventions

WARNING	**The signal word Warning with the associated safety icon implies information that, if disregarded, could result in death or serious injury, or serious product damage.**
CAUTION	**The signal word Caution with the associated safety icon implies information that, if disregarded, may result in minor or moderate injury, or serious product damage.**
CAUTION	**The signal word Caution may be used without the safety icon to state potential damage or injury that is not related to the product.**
NOTE	**Notes contain information more important than the surrounding text, such as exceptions or preconditions. They also refer the reader elsewhere for additional information, remind the reader how to complete an action (when it's not part of the current procedure, for instance), or tell the reader where something is located on the screen. There is no warning level associated with a Note.**

Installation Requirements for Compliance with Radio Frequency (RF) Energy Exposure Safety Standards

ATTENTION!

This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

To ensure compliance to RF Energy Safety Standards:

- Install only Motorola approved antennas and accessories.
- Be sure that Product Safety and RF Safety Booklet enclosed with this radio is available to the end user upon completion of the installation of this radio.

Before using this product, the operator must be familiar with the RF energy awareness information and operating instructions in the Product Safety and RF Exposure booklet enclosed with each radio (Motorola Publication part number 6804113J25 for APAC & LACR and 6866537D37 for EMEA) to ensure compliance with Radio Frequency (RF) energy exposure limits.

For a list of Motorola-approved antennas and other accessories, visit the following web site which lists approved accessories for your radio model.

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ADDITIONAL IMPORTANT INFORMATION FOR SERVICING AND INSTALLING THE TERMINAL

Only specialized workshops should be contacted for installation, maintenance and repair work.

This unit is equipped with protection fuses in the Power and Ignition Sense Cable. Replace these fuses only with the original ratings!

CAUTION

Failure to use correct manufacturer-approved parts may result in physical damage to this unit.

Fuse for Power Cable GKN6270/GKN6274: 10A (Motorola Part Number: 6500139767)

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DOCUMENT HISTORY

The following major changes have been implemented in this manual since the previous edition:

Edition	Description	Date
68015000181-A	Initial edition	Dec 2010
68015000181-B	Toroid updates	Dec 2010

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SCOPE

Scope of This Manual

This manual is intended for use by service technicians familiar with similar types of equipment. It contains information required for the installation of the equipment described and is current as of the printing date. Changes which occur after printing date may be incorporated by a complete Manual revision or alternatively as additions.

NOTE

The mobile terminal has to be installed by trained service personnel only.

All installations should take place in accordance with the requirements of the vehicle and antenna manufacturer/supplier.

This manual is divided into the following sections:

- Safety and General Information
- Document History
- Contents
- Scope of this manual
- Model Information
- Installation
- APPENDIX Product Specific Information

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MTM5400 Manuals and User Guides

Installation Instructions

68015000181 MTM5400 Installation Manual (English)
68015000603 MTM5400 Installation Manual (English/German)

Service Manual

68015000183 MTM5400 / MTM800 FuG Basic Service Manual EMEA (English)
68015000587 MTM5400 Basic Service Manual APAC (English)

Quick Start Guides

68015000289 MTM5400 Quick Start Guide (English)
68015000290 MTM5400 Quick Start Guide (Spanish)
68015000291 MTM5400 Quick Start Guide (Norwegian)
68015000292 MTM5400 Quick Start Guide (Dutch)
68015000293 MTM5400 Quick Start Guide (German)
68015000294 MTM5400 Quick Start Guide (Polish)
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68015000297 MTM5400 Quick Start Guide (Danish)
68015000298 MTM5400 Quick Start Guide (Swedish)
68015000288 MTM5400 Quick Start Guide (Traditional Chinese)
68015000287 MTM5400 Quick Start Guide (Simplified Chinese)
68015000286 MTM5400 Quick Start Guide (Korean)
68015000285 MTM5400 Quick Start Guide (Arabic)
68015000284 MTM5400 Quick Start Guide (Lithuanian)

User Guides

68015000180 MTM5400 Feature User Guide (English)
68015000186 MTM5400 Feature User Guide (English/German)

Safety Leaflets

6804113J25 Mobile Safety Leaflet (APAC & LACR)
6866537D37 Mobile Safety Leaflet (EMEA)

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Warranty and Service Support

Motorola offers long term support for its products. This support includes full exchange and/or repair of the product during the warranty period, and service/ repair or spare parts support out of warranty. Prior to shipping any terminal back to the appropriate Motorola warranty depot, please contact Customer Resources or your Motorola dealer, distributor or reseller.
All returns must be accompanied by a Warranty Claim Form, available from your Customer Service representative or Motorola Online Extranet (MOL) or your Motorola dealer, distributor or reseller.

Warranty Period and Return Instructions

The terms and conditions of warranty are defined fully in the Motorola Customer, Dealer or Distributor or Reseller contract. These conditions may change from time to time and the following notes are for guidance purposes only.
In instances where the product is covered under a "return for replacement" or "return for repair" warranty, a check of the product should be performed prior to shipping the unit back to Motorola. This is to ensure that the product has been correctly programmed or has not been subjected to damage outside the terms of the warranty.
Prior to shipping any terminal back to the appropriate Motorola warranty depot, please contact Customer Resources (please refer to following pages). All returns must be accompanied by a Warranty Claim Form, available from your Customer Services representative. Products should be shipped back in the original packaging, or correctly packaged to ensure no damage occurs in transit.

After Warranty Period

After the Warranty period, Motorola continues to support its products in two ways.

- Motorola's Regional Radio Support Centres offer a repair service to both end users and dealers at competitive prices.
- AAD supplies individual parts and modules that can be purchased by dealers who are technically capable of performing fault analysis and repair.

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Service Information

Europe, Middle East and Africa Region

EMEA Systems Support Centre (ESSC)

The EMEA Systems Support Centre provides a remote Technical Support Service to help customers resolve technical issues and quickly restore networks and systems. This team of highly skilled professionals is available to customers with current service agreements in place that include the Technical Support Service. The ESSC technical experts may be accessed through the EMEA Integrated Call Center either electronically or using the telephone numbers listed below. If you are unsure as to whether or not your current service agreement entitles you to benefit from this service, or if you would like more information about the Technical Support Service, please contact your local customer support or account manager for further information.

Contact details:

Email: ESSC@motorolasolutions.com

List of Telephone Numbers:

Country	In Country Number to Dial
Austria	01206091087
Denmark	043682114
France	0157323434
Germany	06950070204
Italy	0291483230
Lithuania	880 030 828
Netherlands	0202061404
Norway	24159815
Portugal	0217616160
Russia	810 800 228 41044 (Alternative 810 800 120 1011)
Saudi Arabia	800 844 5345
South Africa	0800981900
Spain	0912754787
United Kingdom	02030 277499

It is recommended that access from any other country uses: +44 2030 277499

EMEA Systems Component Centre (ESCC)

The European Systems Component Centre provides a repair service for infrastructure equipment. Customers requiring repair service should contact the Customer Information Desk to obtain a Return Material Authorisation number. The equipment should then be shipped to the following address unless advised otherwise.

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Motorola GmbH, European Systems Component Centre, Am Borsigturm 130, 13507 Berlin, Germany

Contact details:

Email: ESCC.admin@motorolasolutions.com

Telephone Number: +49 30 66861555
Fax: +49 30 66861426

Mon - Fri 08:00 am to 06:00 pm (CET)

Parts Identification and Ordering

Request for help in identification of non-referenced spare parts should be directed to the Customer Care Organization of Motorola's local area representation. Orders for replacement parts, kits and assemblies should be placed directly on Motorola's local distribution organization or via the Extranet site Motorola Online at https://emeaonline.motorola.com.

EMEA Test Equipment Support

Information related to support and service of Motorola Test Equipment is available by calling the Motorola Test Equipment Service Group in Germany at +49 (0) 6128 702179, Telefax +49 (0) 6128 951046, through the Customer Care Organization of Motorola's local area representation, or via the Internet at http://www.gd-decisionsystems.com/cte/.

Your Input

...is much appreciated. If you have any comments, corrections, suggestions or ideas for this publication or any other requirements regarding Motorola publications, please send an e-mail to doc.emea@motorola.com.

Updated Versions of this Manual

...are available at our Extranet site Motorola Online. Contact us at doc.emea@motorola.com for access.

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Asia, Pacific Region

Piece Parts

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola part number is assigned to the part, it is available from Motorola Radio Aftermarket and Accessory Division (AAD). If no part number is assigned, the part is not normally available from Motorola. If a parts list is not included, this generally means that no user-serviceable parts are available for that kit or assembly.
Note on this digital TETRA Terminal: **The CPS has no capability to tune the terminal. Tuning the terminal can only be performed at the factory or at the appropriate Motorola Repair Centre. Component replacement can affect the terminal tuning and must only be performed by the appropriate Motorola Repair Centre.**
All orders for parts/information should include the complete Motorola identification number. All part orders should be directed to your local AAD office. Please refer to your latest price pages.

Technical Support

Technical support is available to assist the dealer/distributor in resolving any malfunction which may be encountered. Initial contact should be by telephone wherever possible.
When contacting Motorola Technical Support, be prepared to provide the product model number and the unit's serial number.

Further Assistance from Motorola

You can also contact the Customer Help Desk through the following web address: http://www.motorola.com/tetra.

Parts Identification and Ordering

Request for help in identification of non-referenced spare parts should be directed to the Customer Care Organization of Motorola's local area representation. Orders for replacement parts, kits and assemblies should be placed directly on Motorola's local distribution organization or via Motorola Online (Extranet).

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Latin America Region

Latin America Radio Support Centres
The Customer Support is available through the following service centres:

Warranty and Repairs:

MOTOROLA DE COLOMBIA SERVICE CENTRE
Torre Banco Ganadero
Carrera 7 No. 71-52
Torre B piso 13
Oficina 1301
Bogota - Colombia
(571) 376-6990

MOTOROLA DE MEXICO SERVICE CENTRE
Bosques de Alisos #125
Col. Bosques de las Lomas
CP 05120 Mexico DF
5252576700

Piece Parts:

To order parts in Latin America and the Caribbean contact your local Motorola CGISS representative.

MOTOROLA, INC.
Latin American Countries Region
789 International Parkway
Sunrise, FL 33325
USA 954-723-8959

MOTOROLA DE ARGENTINA
Ave. del Libertador 1855
B1638BGE, Vicente Lopez
Buenos Aires, Argentina
5411-4317-5300

MOTOROLA DE LOS ANDES C.A.
Ave. Francisco de Miranda
Centro Lido, Torre A
Piso 15, El Rosal
Caracas, 1060 Venezuela
58212-901-4600

MOTOROLA DO BRASIL LTDA.
Av. Chedid Jafet
222 Bloco D Conjuntos 11,12,21,22 E 41
Condominio Millennium Office Park
04551-065- Vila Olimpia, Sao Paulo
Brasil
5511-3847-668

MOTOROLA CHILE
Ave. Nueva Tajamar 481
Edif. World Trade Center
Of. 1702, Torre Norte
Las Condes
Santiago, Chile
562-338-9000

MOTOROLA DE COLOMBIA, LTDA.
Carrera 7 #71-52
Torre A, Oficina 1301
Bogotá, Colombia
571-376-6990

MOTOROLA DE COSTA RICA
Parque Empresarial Plaza Roble
Edificio El Portico, 1er Piso
Centro de Negocios Internacional
Guachepelin, Escazu
San Jose, Costa Rica
506-201-1480

MOTOROLA DEL ECUADOR
Autopist Gral. Rumiñahui, Puente 2
Conjunto Puerta del Sol Este-Ciudad Jardin
Pasa E, Casa 65
Quito, Ecuador
5932-264-1627

MOTOROLA DE MEXICO, S.A.
Calle Bosques de Alisos #125
Col. Bosques de Las Lomas
05120 México D.F.
México
52-555-257-6700

MOTOROLA DEL PERU, S.A.
Ave. República de Panama 3535
Piso 11, San Isidro
Lima 27, Peru
511-211-0700

Technical Support:

https://businessonline.motorola.com, go to Contact Us to request technical support

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola part number is assigned to the part, it is available from Motorola. If no part number is assigned, the part is not normally available from Motorola. If the part number is appended with an asterisk, the part is serviceable by Motorola Depot only. If a parts list is not included, this generally means that no user-serviceable parts are available for that kit or assembly.

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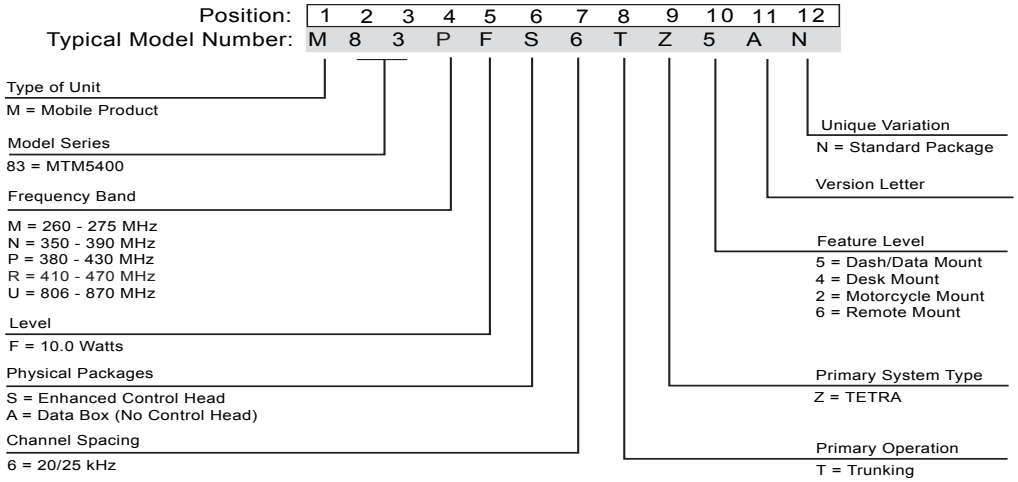
MODEL INFORMATION & ACCESSORIES

MTM5400 Mobile Terminal Model Information

This manual applies to the following Mobile Terminal Models

Type No.	Sales Model No.	Short Description	Model
MT953C	M83PFS6TZ5AN	MTM5400 380-430MHz, DASH	M1
MT953C	M83PFS6TZ4AN	MTM5400 380-430MHz, DESK	M2
MT953C	M83PFS6TZ6AN	MTM5400 380-430 MHz, REMOTE	M3
MT953C	M83PFS6TZ2AN	MTM5400 380-430 MHz, M'CYCLE	M4
MT953C	M83PFA6TZ5AN	MTM5400 380-430 MHz, DATA	M5

Sales Model Nomenclature


Position: 1 2 3 4 5 6 7 8 9 10 11 12
Typical Model Number: M 8 3 P F S 6 T Z 5 A N
Type of Unit
M = Mobile Product
Model Series
83 = MTM5400
Frequency Band
M = 260 - 275 MHz
N = 350 - 390 MHz
P = 380 - 430 MHz
R = 410 - 470 MHz
U = 806 - 870 MHz
Level
F = 10.0 Watts
Physical Packages
S = Enhanced Control Head
A = Data Box (No Control Head)
Channel Spacing
6 = 20/25 kHz
Primary Operation
T = Trunking
Primary System Type
Z = TETRA
Feature Level
5 = Dash/Data Mount
4 = Desk Mount
2 = Motorcycle Mount
6 = Remote Mount
Version Letter
Unique Variation
N = Standard Package

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Model Specifications*

GENERAL		RECEIVER		TRANSMITTER	
ETSI:	ETS 300 394-1 ETS 300 489-1	**Receiver Type:**	Direct Conversion	**Modulation Type:**	π/4DQPSK
Type Number:		**Frequency Range:**		**RF Power:**	
MTM5400 380-430 MHz	MT953C	MTM5400	380-430 MHz	TMO DMO	10W / 40dBm 10W / 40dBm
Temperature Range for Transceiver:		**Channel Spacing:**	25 kHz	**Frequency Range TMO:**	
Operating Storage:	-30°C to +60°C -40°C to +85°C	**Sensitivity (3.5%) BER:**	-114.5 dBm	MTM5400	380-430 MHz
Power Supply:				**Frequency Range DMO:**	
Minimum: Nominal: Maximum: Max. Current	10.8 Vdc 13.2 Vdc 15.6 Vdc Approx. 4.5 A	**Intermodulation:** **Blocking (50-100 kHz):**	-47 dBm -40 dBm	MTM5400	380-430 MHz
Dimensions (HxWxD) in mm:		**Spurious Rejection:**	-45 dBm	**Frequency Stability:**	
Transceiver with Enhanced Control Head, Dash Mount	60 x 188 x 198	Adjacent Channel Interference Ratio:	-45 dB	Locked to Base Not Locked to Base	+/-100 Hz +/- 1 kHz
Weight in grams:		**Frequency Stability:**		**Spurious Emissions:**	
Transceiver with Enhanced Control Head, Dash Mount	1500	Locked to Base Unlocked to Base	+/-100 Hz +/- 1 kHz	Conducted/Radiated	- 36 dBm <=1GHz - 30 dBm > 1GHz
GPS Performance		**Audio Rated** (@4 Ohms):		**Adjacent Channel Power Ratio**	
Autonomous Acquisition Sensitivity	-143 dBm / -173 dBW	For External Speaker: Distortion at Rated Audio:	10 W 5% Max.	(@ ± 25kHz)	
Tracking Sensitivity	-159 dBm / - 189 dBW			380-430 MHz	- 60 dBc

*) Technical information may be subject to change without further notice.

Model Descriptions**

Model	Description
M1	Dash Mount with Mobile Terminal with Direct Mount Enhanced Control Head, Speaker, Microphone or Handset, Standard User Guide, and Installation Accessories.
M2	Desk Mount with Mobile Terminal with Direct Mount Enhanced Control Head, Speaker, Microphone or Handset, Standard User Guide, Installation Accessories and Tray with a Power Supply.
M3	Remote Mount with Mobile Terminal with Remote Mount Enhanced Control Head, optional either with Remote Head Enhanced or Data Expansion Head Enhanced, Speaker, Microphone or Handset, Remote Mount cables, Standard User Guide, and Installation Accessories.
M4	Motorcycle Mount with Mobile Terminal with Motorcycle Mount Enhanced Control Head, optional either with Remote Head Enhanced or Data Expansion Head Enhanced, Speaker, Microphone or Handset, Motorcycle cables, Standard User Guide, and Installation Accessories; Audio Accessories, Standard User Guide, and Installation Accessories.
M5	Data Box - Remote Mount Configuration with Expansion Head Enhanced, without Enhanced Control Head, Remote Mount cables, Standard User Guide, Installation Accessories, and a Power Supply.

**) Other combinations are not recommend or not possible.

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Accessories-to-Model Chart

ACCESSORIES						
Control Heads	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Control Head, Roman Keypad	PMWN4009	X	X			
Control Head, Arabic Keypad	PMWN4012	X	X			
Control Head, Cyrillic Keypad	PMWN4014	X	X			
Control Head Hungarian Keypad	PMWN4015	X	X			
Control Head Hebrew Keypad	PMWN4016	X	X			
Remote Mount Control Head, Roman Keypad	PMWN4017			X		
Remote Mount Control Head, Arabic Keypad	PMWN4020			X		
Remote Mount Control Head, Cyrillic Keypad	PMWN4022			X		
Remote Mount Control Head, Hungarian Keypad	PMWN4023			X		
Motorcycle Mount Enhanced Control Head, Roman Keypad	PMWN4002				X	
Motorcycle Mount Enhanced Control Head, Arabic Keypad	PMWN4005				X	
Motorcycle Mount Enhanced Control Head, Cyrillic Keypad	PMWN4007				X	
Motorcycle Mount Enhanced Control Head, Hungarian Keypad	PMWN4008				X	
Expansion & Remote Head Kits	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Data Expansion Head	PMLN4908			X	X	X
Remote Head	PMLN4904			X	X	
Microphones	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Desktop Microphone, Mobile Microphone Port	RMN5106	X	X	X		
Compact Fist Microphone	RMN5107	X	X	X	X	
Fist Microphone (use together with Junction Box)[4]	GMMN4063	X	X	X		X
Loudspeakers	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Small Loudspeaker, 5W (use together with Junction Box)[4]	GMSN4078	X	X	X	X	X
External Speaker, 5W	RSN4004	X	X	X	X	
External Speaker, 13W	RSN4002	X	X	X	X	
Speaker Extension Cable (use together with Junction Box)	GMKN4084	X	X	X	X	
Speaker Extension Cable	PMKN4119	X	X	X	X	

PTT Switches	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
External PTT with Emergency Footswitch	RLN4836	X	X	X	X	
Gooseneck PTT	RLN4858	X	X	X	X	
Pushbutton with Remote PTT	RLN4857	X	X	X	X	
Push Button PTT	RLN5926	X	X	X	X	
Desktop & Data Box Mount	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**

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ACCESSORIES						
Desktop Tray without Loudspeaker	GLN7318		X			
Desktop Tray with Loudspeaker	RSN4005A		X			
Desktop Power Supply	HPN4007C		X			X
Desktop Power Supply	GPN6145B		X			X
Power Cable (For Desktop Power Supply HPN4007C)	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
US Linecord (3060665A04) Packed	NTN7373		X			X
Euro Linecord (3060665A05) Packed	NTN7374		X			X
UK Linecord (3002120F02) Packed	NTN7375		X			X
Power Cable, for use with HPN4007C and GPN6145B	GKN6266		X			X
Cables	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Remote Mount Cable (Terminal to C/H), 3m	RKN4077			X	X	
Remote Mount Cable (Terminal to C/H), 5m	RKN4078			X	X	
Remote Mount Cable (Terminal to C/H), 7m	RKN4079			X	X	
Remote Mount Cable (Terminal to C/H), 10m	PMKN4020			X	X	
Accessories Expansion Cable, 2.3m	PMKN4029			X	X	
Motorcycle Mount TELCO Cable, 2.3m	PMKN4030				X	
Junction Box	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Junction Box	GMLN5089	X	X	X	X	
Cable 6m Transceiver to Junction Box[4]	PMKN4101	X	X	X	X	
Cable 4m Transceiver to Junction Box[4]	PMKN4102	X	X	X	X	
Cable 2m Transceiver to Junction Box[4]	PMKN4103	X	X	X	X	
Power Cables (to Mobile Terminal)	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
12V Power Cable to Battery, 3m with Fuse (10 A)	GKN6270	X		X	X	
12V Power Cable to Battery, 6m with Fuse (10 A)	GKN6274	X		X	X	
Installation	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
External Alarm Relay	GKN6272	X	X	X	X	
Accessory Connector Kit - radio rear 26-pin plug	HLN9457	X	X	X	X	
Accessory Connector Kit - junction box 26-pin plug[1]	PMLN5072A	X	X	X	X	
Buzzer Kit	GLN7282	X	X	X	X	
Mounting (Transceiver)	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Key Lock Mount	RLN4779	X	X	X	X	X
High Profile Mounting Bracket	GLN7317	X	X	X	X	X
Low Profile Mounting Bracket	GLN7324	X	X	X	X	X
Mounting Frame to Install Transceiver in DIN-A Slot	PMLN5094	X	X	X	X	X
Mounting (Control Head)	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Remote Mount Trunnion Kit	PMLN4912			X		
Motorcycle Mount Trunnion Kit	PMLN5092				X	

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ACCESSORIES						
DIN Mount Bracket	PMLN5093			X		
Programming/Data	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
USB Programming Cable (Terminal Rear Port)	PMKN4110	X	X	X	X	
Programming Cable	PMKN4105	X	X	X	X	
Active Data Cable[4]	PMKN4104	X	X[4]	X	X	
USB Programming Cable (Mobile Microphone Port)	HKN6184	X	X	X	X	
Antennas (sold with terminals)	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Antenna Whip Tetra Hinged 380 – 430MHz	GMAE4253A	X	X	X	X	X
Antenna Tetra Glass Mount 410 – 430MHz	GMAE4254A	X	X	X	X	X
Antenna Tetra Panel/Roof Mount 380 – 430MHz	GMAE4255A	X	X	X	X	X
Antenna Tetra Magnetic Mount 380 – 400MHz	GMAE4256A	X	X	X	X	X
Antenna Tetra Magnetic Mount 410 – 430MHz	GMAE4257A	X	X	X	X	X
Antenna Tetra Covert Strip Glass 380 – 400MHz	GMAE4258A	X	X	X	X	X
Antenna Tetra Covert Strip Glass 410 – 430MHz	GMAE4259A	X	X	X	X	X
Antenna Tetra Low Profile 380 – 400MHz	GMAE4260A	X	X	X	X	X
Antenna Tetra Low Profile 410 – 430MHz	GMAE4261A	X	X	X	X	X
Antenna Tetra Wall Mount 380 – 400MHz	GMAE4262A	X	X	X	X	X
Antenna Tetra Wall Mount 410 – 430MHz	GMAE4263A	X	X	X	X	X
Antenna Tetra Motorcycle 380 – 400MHz	GMAE4266A	X	X	X	X	X
Antenna Tetra Motorcycle 410 – 430MHz	GMAE4267A	X	X	X	X	X
Antennas (base only) and Whips	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
Antenna Mount Panel/Roof thickness up to 4mm	GMLN4276A	X	X	X	X	X
Antenna Mount Panel/Roof thickness up to 6mm	GMLN4277A	X	X	X	X	X
Antenna Mount Magnetic	GMLN4278A	X	X	X	X	X
Antenna Whip Tetra Flexible Hinged 380 – 400MHz	GMAE4279A	X	X	X	X	X
Antenna Whip Tetra Flexible Hinged 410 – 430MHz	GMAE4280A	X	X	X	X	X
Antenna Whip Tetra Flexible Hinged 380 – 430MHz	GMAE4281A	X	X	X	X	X
Antenna Whip Tetra Hinged 380 – 400MHz	GMAE4282A	X	X	X	X	X
Antenna Whip Tetra Hinged 410 – 430MHz	GMAE4283A	X	X	X	X	X
Antenna Whip Tetra Hinged 380 – 430MHz	GMAE4284A	X	X	X	X	X
GPS	**Part Number**	**M1**	**M2**	**M3**	**M4**	**M5**
GPS Adaptor	PMKN4114	X	X	X	X	X

1) Keep the GCAI connector cover supplied with the new Control Head.

2) Requires Junction Box, GMLN5089.

3) Currently the GCAI handset has insufficient margin to EMC requirements and may require additional protection to pass. Additional protection can in most cases be provided by the car body and by planning to installation such that strong coupling from other electrical and electronic installation in the vehicle are avoided. In cases where further EMC protection is needed

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this can be achieved by installing (P/N: 01015001001) as shown in kit leaflet.
The specific configuration can be tested using the following technique:
The test requires a second radio in a quiet place or cooperation with a dispatcher.
1. Ensure that all other electrical and electronic equipment in the vehicle that may cause interference is not active.
2. Then check all intended RX and TX audio paths of the radio installation one at a time.
3. Listen to the idle channel noise and make sure there is no obvious noise or disturbance that can be attributed to radiated or magnetically coupled interference. Speech must be clear over the channel.

4) The cable, PMKN4104, is only compatible when a Data Expansion Head Enhanced is not fitted as part of a remote mount configuration. In this configuration access to the Tetra PEI for IP Packet Data and SDS services is available on the Data Expansion Head Enhanced and the Active Data Cable PMKN4104 is not required.

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INSTALLATION

Introduction

General Information

This product must be installed in a vehicle in accordance with the vehicle manufacturer's guidelines and the instruction detailed in this manual.
Only the specified Motorola parts in this manual should be used. Failure to do so could result in non compliance to the Automotive Directive (72/245/EEC, as amended by 95/54/EC).

For products fitted to two and three wheeled vehicles, Directive 97/24/EC applies.

This Terminal is only designed and certified to be used for terrestrial use only.

There are two methods of installing the mobile terminal in a vehicle:

1. Using the direct mounting trunnion and power cables supplied with a standard radio package.
2. Remote mounted in the car radio cut-out (using the required DIN mounting kit PMLN5094), per ISO7736.

An accessory connector on the rear of the terminal enables you to attach different accessories (see section "Accessory Connection Plan").

A mobile microphone port on the front control head panel (see page 65) provides for the connection of various types of microphones (Desktop Microphone RMN5106 or Compact Microphone RMN5107).

This terminal is ONLY made for 12 V power supply connection. In vehicles with 24 V power supply, a DC/DC converter is required.

Please be aware when planning the installation that there is a current consumption of approx. 4.5 A during PTT and up to 30 mA when terminal is switched off.

1. Mount the terminal horizontally near the driver, so the driver can easily view, access and operate the controls and accessories.
2. Ensure that the location is not exposed to dirt and moisture.
3. Verify that there will be sufficient space around the mobile unit for air flow and installation.
4. Check that there is enough routing space for the power cable connector and the antenna coaxial cable.
5. Plan the best place to run connections to minimize pinching, crushing, and overheating of wires and cables.

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NOTE **In a vehicle with an airbag, make sure that the mounting location of the mobile terminal, or of any terminal accessory, is not in the deployment path of the air bag.**

CAUTION **Uninstaling the radio**

OPTION 1:
Before disconnecting the 13.2 V main power supply from the radio:
1. Switch off the radio.
2. Wait for a minimum of 4 seconds after the radio switch is released.
3. Disconnect the 13.2 V main power supply.

OPTION 2:
Turn off the main power supply WITHOUT switching OFF the radio.

DC Power Cable Installation

Installation Planning

CAUTION **This terminal must be operated only in negative ground electrical systems. Operating the terminal on a positive ground system will cause the cable fuse to short-circuit. Check the vehicle ground polarity before you begin the installation.**

The 3-meter (10-foot) DC power cable shipped with the terminal should be long enough to be installed in most vehicles. Take the following precautions before you begin:

1. Whenever possible, avoid routing the cable above the catalytic converter.
2. Make sure that the power cable never rests on sharp edges.
3. Use grommets whenever a cable has to pass through a hole in a metal panel.

The following table lists power cables available for this terminal:

Table 1 DC Power Cables

Number	Description	Rating
GKN6270	Power Cable to battery with fuse 10 A	12V Power Cable to Battery, Length: 3 m
GKN6274	Power Cable to battery with fuse 10 A	12V Power Cable to Battery, Length: 6 m
6500139767	Fuse 10 A for Power Cable	
6580283E02 *	Fuse 4 A for Ignition Sense Cable	

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CAUTION **In cases of blown fuses, replace ONLY with those of identical value.**
NEVER insert ones of different values.

Installation Procedure

Begin the DC power cable installation as follows:

1. Determine a routing plan, keeping in mind where the terminal is to be mounted and make sure that the cable does not rest on sharp edges.

CAUTION **Improper handling with the power cable may cause shorting to ground. Ensure that during terminal installation the power cable fuse is removed.**

CAUTION **Make sure your power cable is not placed with the antenna in parallel. Interference can cause radio to hang.**

2. Locate an existing hole with grommet in the vehicle fire wall, or use a 9.5 mm (3/8-inch) bit to drill an access hole in the fire wall. Install a grommet with a 5 mm (3/16-inch) inside diameter into the hole to protect the power cable.

CAUTION **Be very careful not to damage existing wires.**

3. From inside the vehicle, feed the red and black leads (without the lugs attached) through the access hole and into the engine compartment. (see Figure 1)

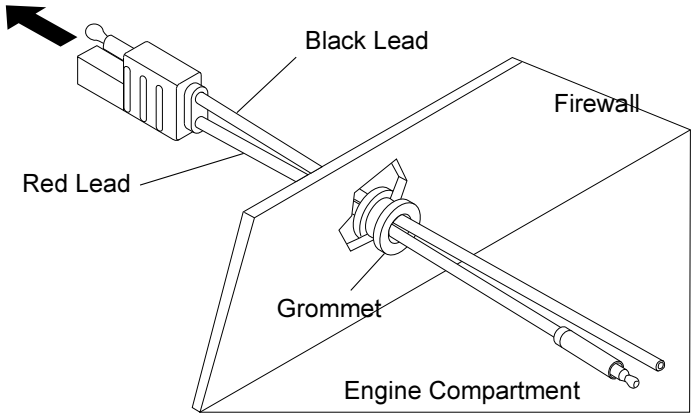

Figure 1 Power Cable Routing into the Engine Compartment

4. Connect the black lead of the DC power cable to the nearest vehicle chassis ground point (using the provided ring lug if necessary). Shorten the black lead to remove any excess cable. (see Figure 2).

NOTE **Locate a good vehicle ground point. The vehicle frame provides the best ground. Optimum terminal performance can only be achieved with a very low resistance ground connection. Verify that the connections between the battery negative terminal, vehicle chassis, and engine block have low resistance.**

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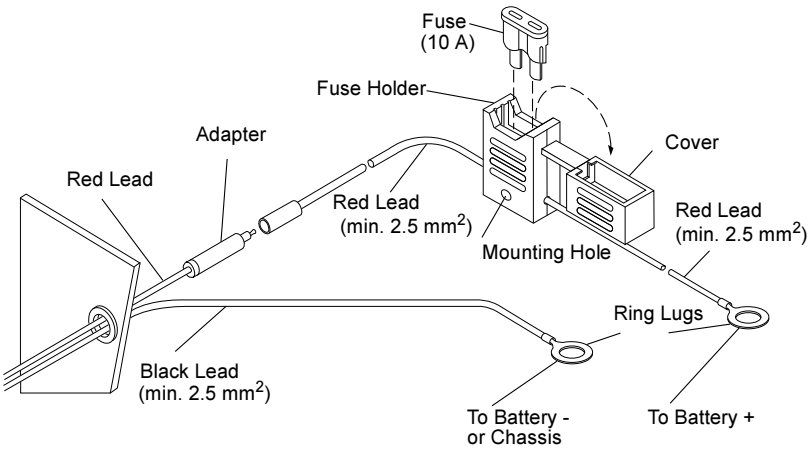

Figure 2 Power Cable Assembly

5. Place the fuse holder close to the battery. Ensure that it is not near any hot engine component. Mount the fuse holder using its mounting hole and dress the wires as required.
6. Insert the stripped end of the red lead of the fuse holder into the ring lug hole and crimp it. Connect the fuse holder red adapter lead plug to the mating receptacle on the red lead of the power cable.
7. Connect the red lead ring lug from the fuse holder to the positive (+) battery terminal. Make sure the adapter cable is connected to the main power cable red lead.
8. Carefully check that all connections are proper. Insert the fuse into the fuse holder and close the cover.

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Terminal Installation

Enhanced Control Head Installation

The Enhanced Control Head can be removed from the housing and turned to any position within a 180° radius. This provides multiple mounting options for the terminal. For example, the terminal may be mounted on either side of the vehicle to facilitate the safest and most ergonomically ideal position. The Enhanced Control Head may then be turned to provide the most convenient access.

To reposition the Enhanced Control Head:

1. Insert the dismantling tool (Motorola P/N 6686119B01) in the groove between the Enhanced Control Head and the terminal assembly as shown in the figure below.
2. Press on the dismantling tool until the snap connectors on the side of the Enhanced Control Head release from the terminal assembly.
3. Pull the Enhanced Control Head away from the terminal assembly.

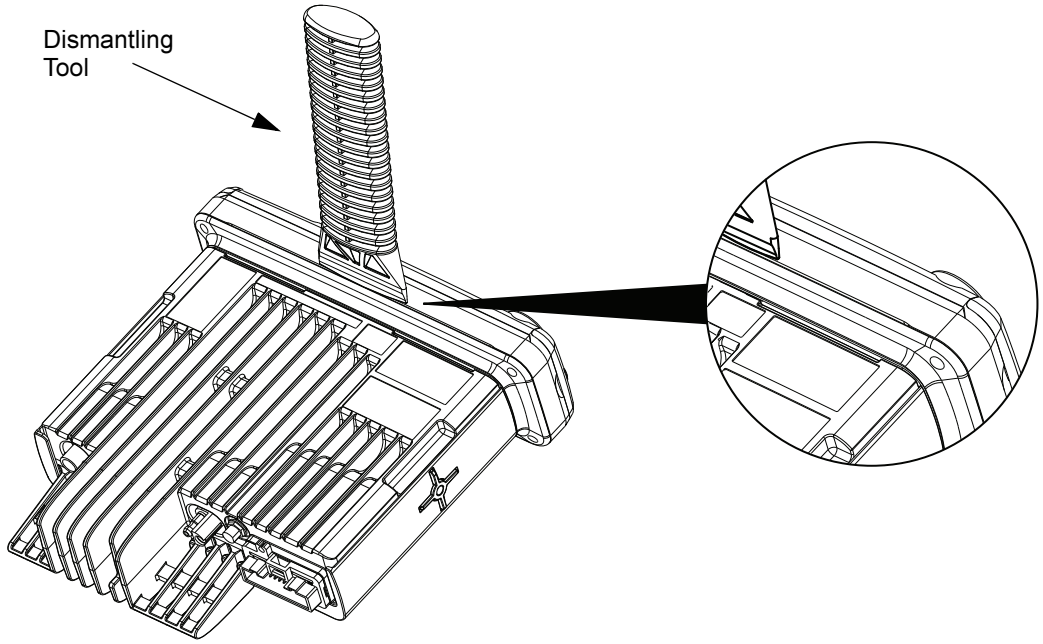

Figure 3 Typical Control Head Removal

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Trunnion Installation

Installation Planning

The trunnion allows the terminal to be mounted to a variety of surfaces.

1. The trunnion must be **securely fixed** to the vehicle chassis.
2. Ensure the surface can support the weight of the terminal.
3. Although the trunnion can be mounted to a plastic dashboard, it is recommended that the mounting screws be located so they penetrate the supporting metal frame of the dashboard.
4. Ground the radio housing to the nearest vehicle chassis ground point, which can be done by removing the paint from the trunnion where the radio and vehicle chassis touches the trunnion, or use a short cable with ring lugs in both end and connect this to chassis under wingscrew.

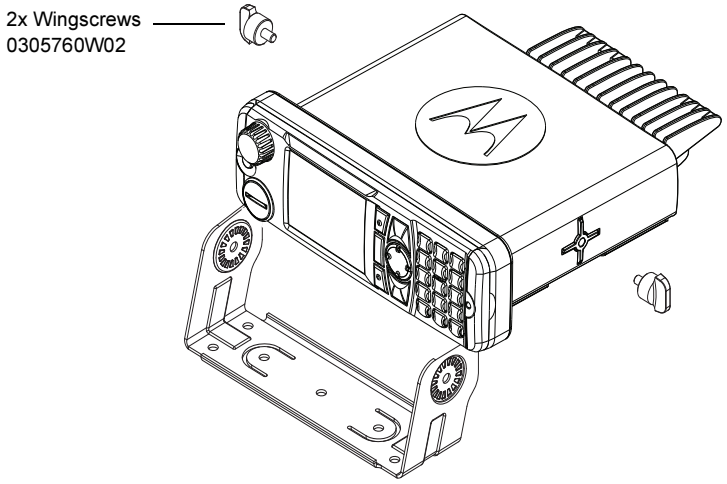

Figure 4 Terminal into High Profile Trunnion (GLN7317)

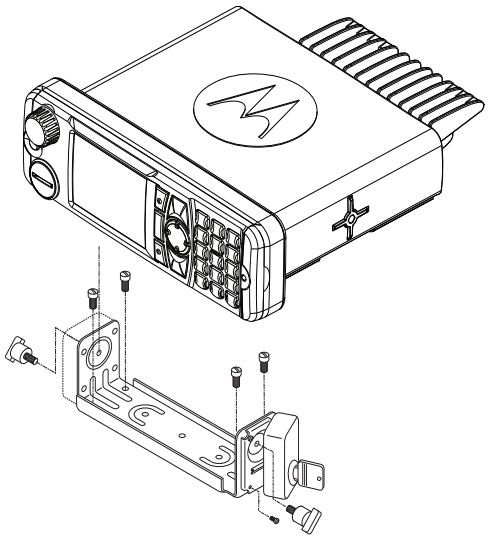

Figure 5 Terminal into Key Locked Mount Trunnion (RLN4779A)

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Installation Procedure

1. Select either the transmission hump or an open underneath portion of the dash to mount your terminal (see Figure 6). When mounting the trunnion on the transmission hump, be careful that the transmission housing is not affected.
2. Use the trunnion mounting bracket as a template, to mark the hole positions on the mounting surface. Use the innermost three holes for a curved mounting surface, such as the transmission hump, and the three outermost holes for a flat surface such as under the dash.
3. Centre-punch the spots you marked and use a 4 mm (5/32-inch) bit to drill a hole at each location.
4. Secure the trunnion mounting bracket to the mounting surface with the three self-tapping screws provided. (See Figure 6.)
5. Slide the terminal into the trunnion. Secure the terminal with the two wing screws provided.

NOTE **The keypad labelling of the control head may vary according to the specific customer/country concerns.**

6. Ground the radio housing to the nearest vehicle chassis ground point, which can be done by removing the paint from the trunnion where the radio and vehicle chassis touches the trunnion, or use a short cable with ring lugs in both end and connect this to chassis under wingscrew.

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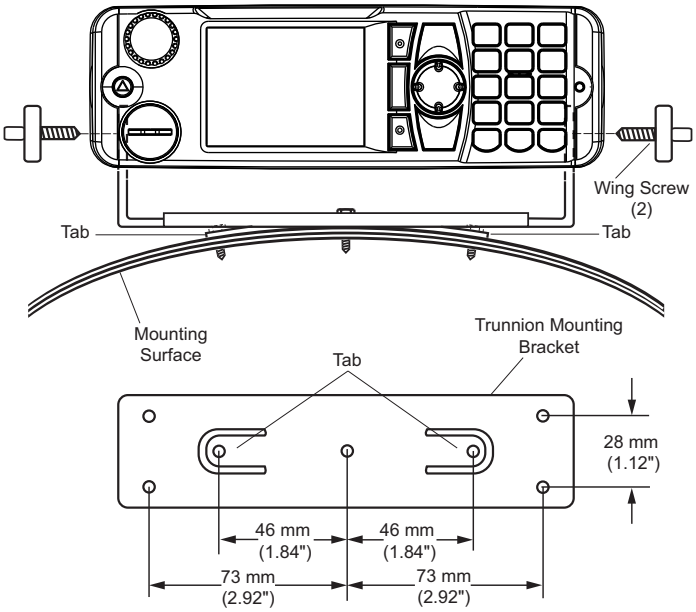
TRANSMISSION HUMP MOUNTING



BELOW DASH MOUNTING

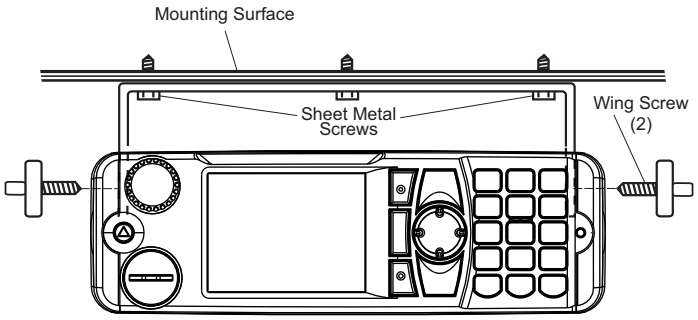


Figure 6 Transmission Hump Mounting (Top) and Below Dash Mounting (Bottom)

Dashboard Installation

Installing the Radio in an Automotive Dashboard

1. Open out the radio cut-out in the dashboard.
2. Remove the top plastic cover off the radio.
3. Insert the mounting frame into the cut-out and retain it by bending back the relevant fixing

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tabs, using all 6 where possible, to hold it in place.

NOTE

The tabs are easily bent back by twisting a large flat-bladed screwdriver into the slot behind the tabs.

For a more secure installation the top and rear of the frame should also be secured with screws.

The demount tool can be used as an aid to mounting as well as demounting.

4. Ground the mouting frame to the nearest vehicle chassis ground point.

Mounting the Radio in the Frame

1. Provide the electrical connections to the radio for power, antenna and accessories.
2. Plug in all the connectors and push the radio with its Remote Head Enhanced, or alternatively the Data Expansion Head Enhanced, firmly onto the mounting frame until the two springs snap into place.

NOTE

The fixing tabs should be checked for tightness each time the radio is removed. The tabs are easily tightened by twisting a large flat-bladed screwdriver in the slot behind the tabs.The frame is not designed for daily mounting and demounting.

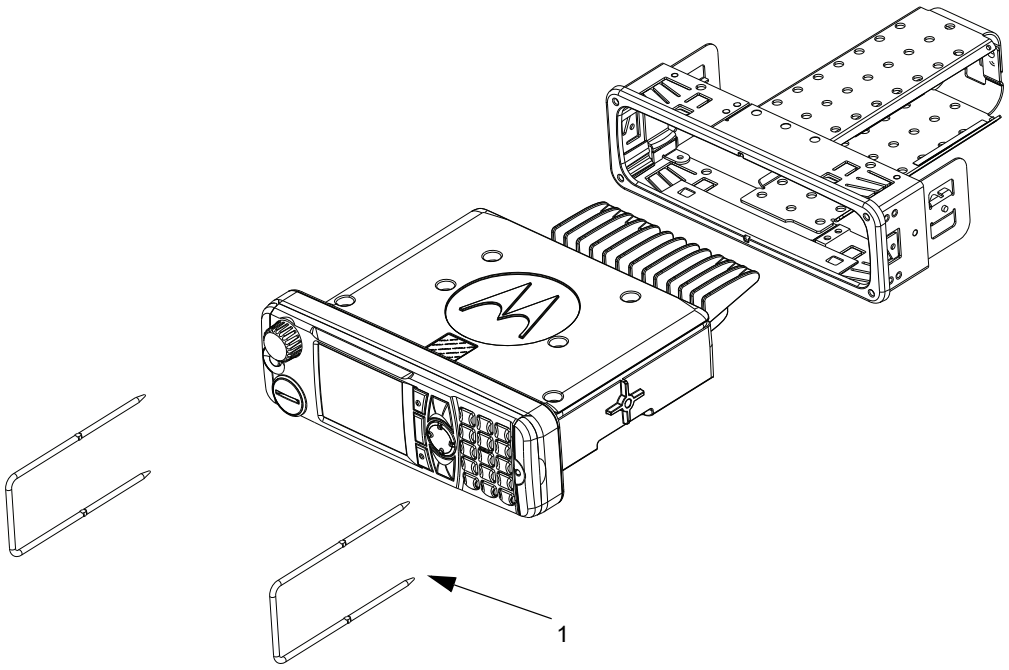

Figure 7 Mounting the Radio into the Frame (Shown with Enhanced Control Head)

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Table 2 DIN Mount Kit Components

Item	Description	Part Number
	DIN Mount Kit	PMLN5094
1	Demount Tool	8166514A01

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Remove the Radio from the Frame

1. Remove both rubber side caps from the Enhanced Control Head.
2. Insert the demount tool into the two openings as shown in Figure 8 below.

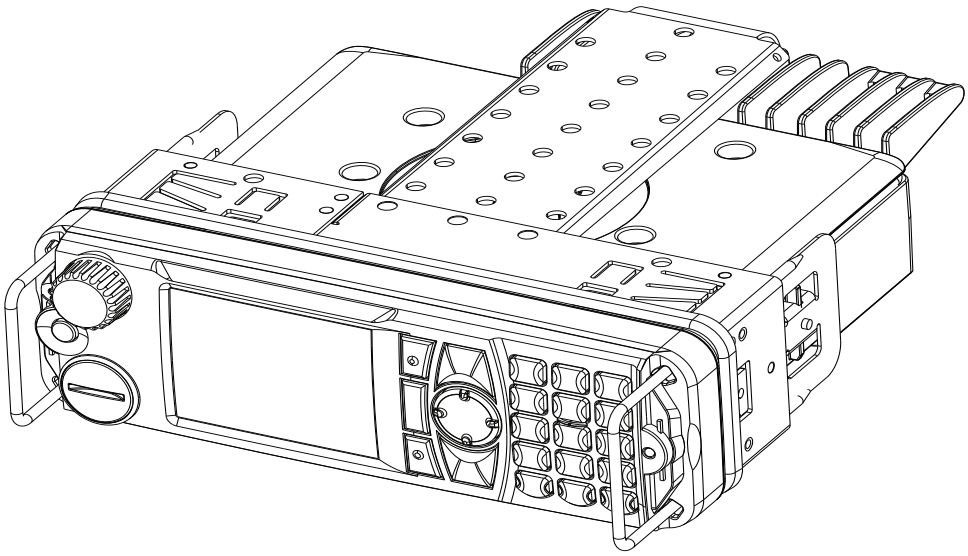

Figure 8 Removing the Radio from the Frame

3. Push the demount tools through the openings in the frame.
4. Slide out the radio.

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Desktop Installation

The MTM5400 may be desktop mounted. The Desktop Station option provides the terminal with the desk microphone, power supply, desk top tray (without speaker) and external loudspeaker.

CAUTION

If an outdoor antenna is used a proper grounded Lightning Protector with Quarter-Wave Shorting Stub must be inserted between the outdoor antenna and the transceiver antenna input. The line voltage power supply shall have a proper ground connection (refer to IEC61312-1). The installation must meet the requirements of any and all applicable local codes and regulations.

Planning

Planning is the key to fast, easy terminal installation. Before a hole is drilled or a wire is run, inspect the location and determine how and where you intend to mount the antenna, terminal and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating. The installation planning should only be undertaken by persons who are competent and able to ensure that the complete installation fulfils its regulatory requirements, such as EMC (Electro Magnetic Compatibility) and IEC (International Electrotechnical Commission).

Installation

1. Be sure line voltage power is available.
2. Make sure sufficient air can flow around the terminal to permit adequate cooling.
3. Choose a flat surface for the desktop tray and external loudspeaker.
4. Be sure the mounting surface is able to adequately support the weight of the terminal and tray.
5. If an outdoor antenna is used choose a location for the terminal as close as possible to the antenna cable inlet of the building. Make sure that the installation of the surge protector is in accordance with the manufacturer’s specifications and safety hints. The line voltage power supply shall be grounded properly.

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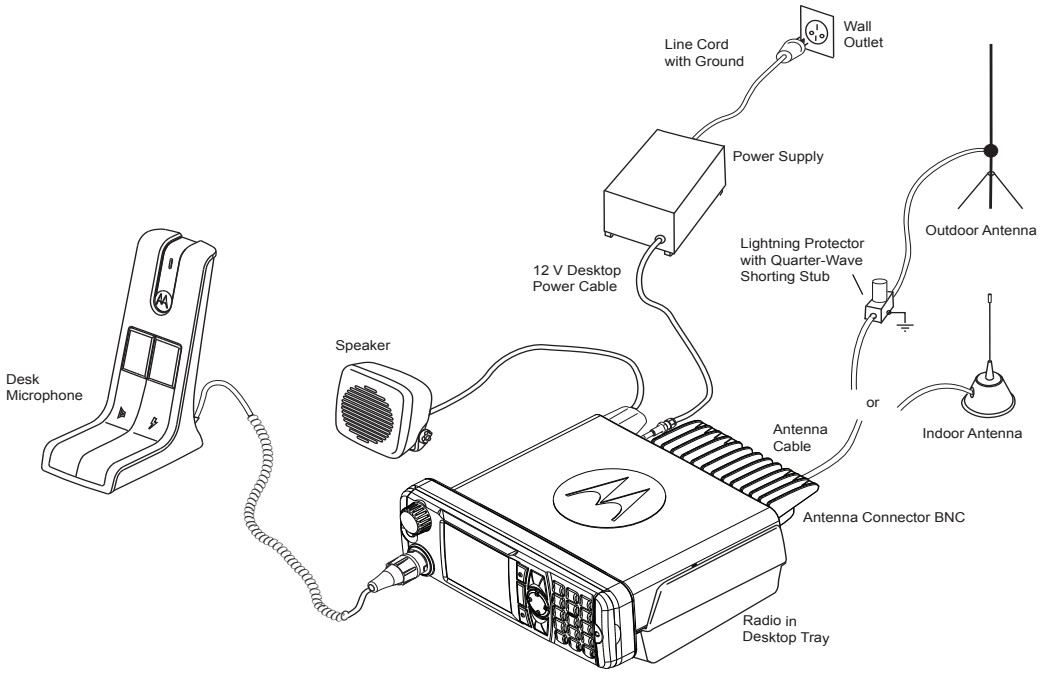

Figure 9 Desktop Mounting (See Table 3 for Part Numbers)

Table 3 Associated Components

Item	Description	Part Number
1	Desktop Microphone	RMN5106
2	External Speaker 13 W	RSN4002A
3	Small Loudspeaker 5 W	RSN4004
4	Desktop Tray w/o speaker	GLN7318
5	Desktop Power Supply Unit	GPN6145B
6	Power cable (power supply to desktop mobile)	GKN6266A
7	Power Supply 14V 15A UNI 117/240 VAC	HPN4007C
8	Lightning Protector with Quarter-Wave Stub Protector in the appropriate frequency range (for example, HUBER+SUHNER[?] : type 3400.17.0389 (UHF) or type 3400.17.0277 (800 MHz)	

CAUTION **5 W speaker (RSN4004) cannot sustain the maximum audio output power of 13 W coming from the terminal when the volume is set to the maximum. This causes the speaker cone to dislocate.**

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Remote Mount Installation

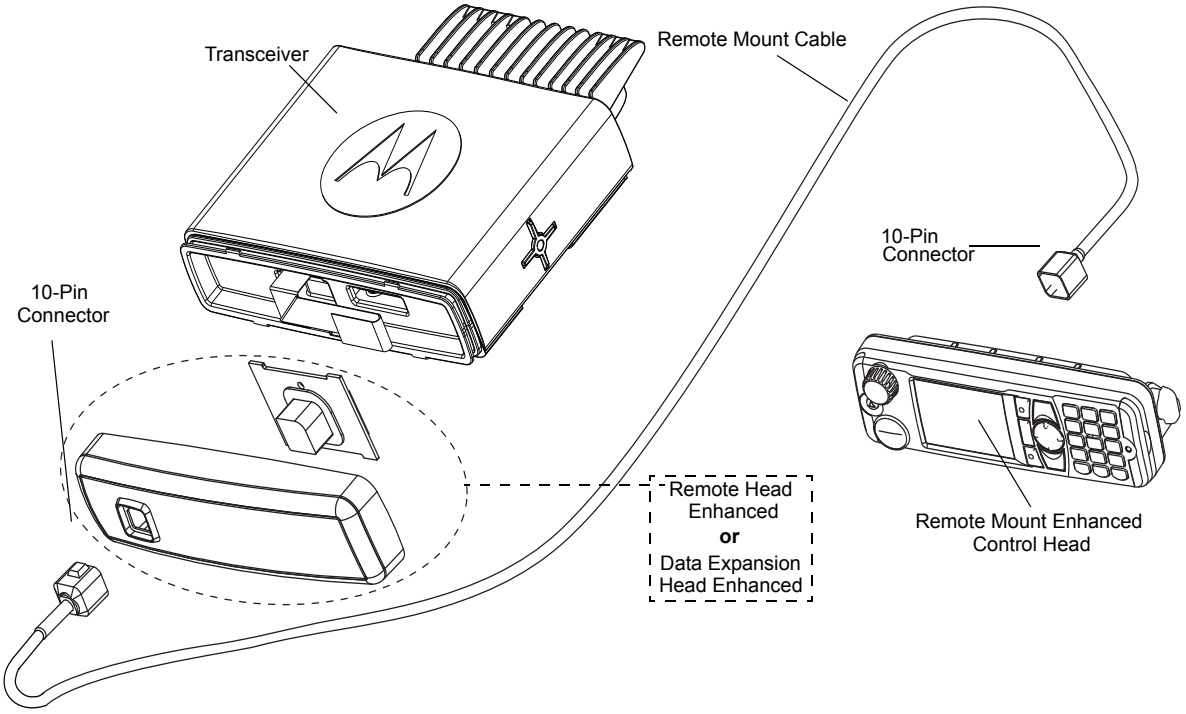

Figure 10 Remote Mount Installation with Remote Head Enhanced/Data Expansion Head Enhanced

Table 4 Associated Components for Remote Mount

Item	Description	Part Number
1	Remote Mount Cable, 3 m	RKN4077
2	Remote Mount Cable, 5 m	RKN4078
3	Remote Mount Cable, 7 m	RKN4079
4	Remote Mount Cable, 10 m	PMKN4020
5	Remote Head Enhanced	PMLN4904
6	Data Expansion Head Enhanced	PMLN4908
Enhancement		
7	Toroid EMC Suppression Kit	01015001001

NOTE

When toroids are used on the Remote Mount Cable, wind 10 times around each toroid.

Each toroid have to be placed 30.0±2.5 cm respectively from the expansion head and the control head.

Winding at both ends reduces the effective cable length approximately by 0.8 m. Fix the toroids firmly to a stable surface once the Remote Mount Cable is connected.

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Installing the Remote Mount Enhanced Control Head onto the Remote Mount Trunnion

1. Slide the Remote Mount Enhanced Control Head onto the mounting trunnion until it snaps into place.
2. Tighten the screws at both sides of the trunnion. After a few turns, tilt the control head for an optimum view of the display. Then, complete the tightening of the screws.

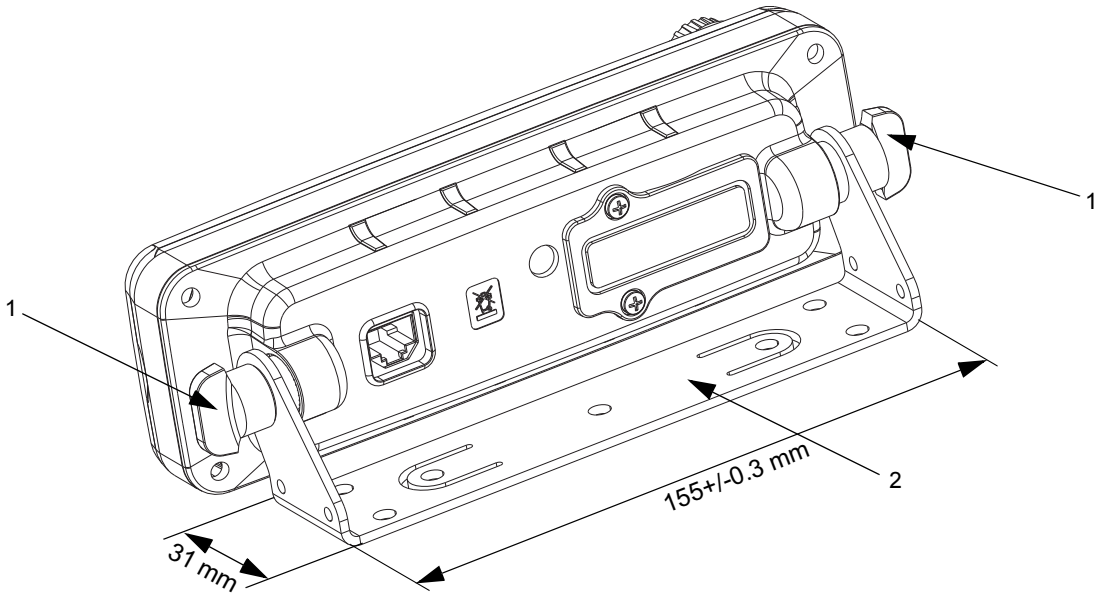

Figure 11 Remote Mount Enhanced Control Head Installation with Remote Mount Trunnion

Table 5 Remote Mount Enhanced Control Head Installation with Remote Mount Trunnion - Mechanical Parts List for Installation

Item	Description	Part Number
1 & 2	Remote Mount Trunnion Kit	PMLN4912

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Installing the Remote Mount Enhanced Control Head in a DIN Mount Bracket

1. Slide the Remote Mount Enhanced Control Head onto the DIN Mount Bracket until it snaps into place.
2. Tighten the screws at both sides of the DIN Mount Bracket.

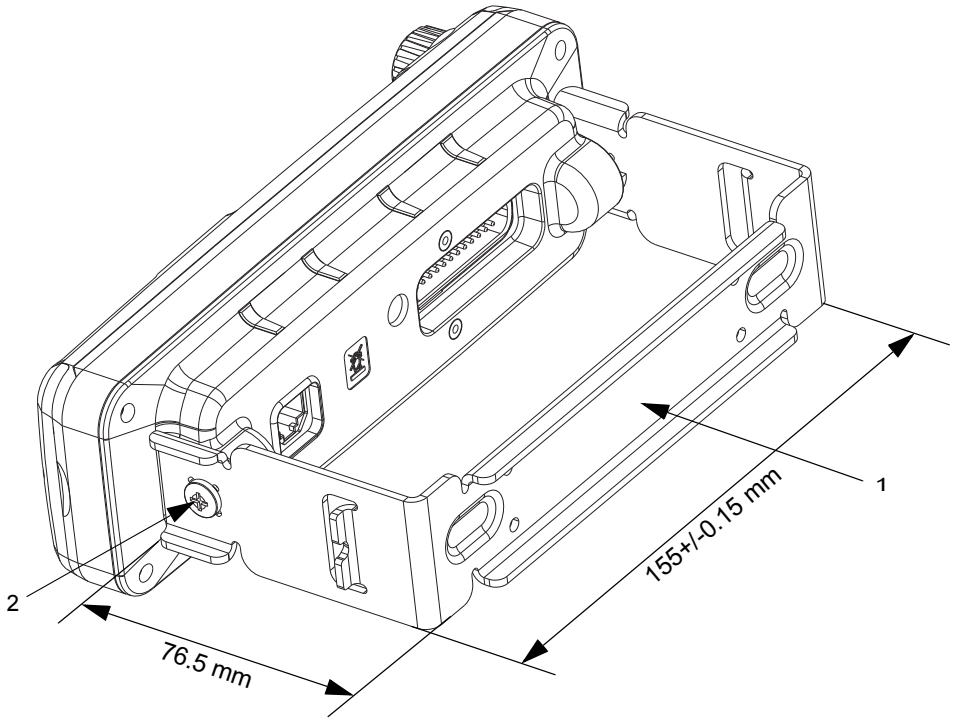

Figure 12 Remote Mount Enhanced Control Head Installation with DIN Mount Bracket

Table 6 Remote Mount Enhanced Control Head Installation with DIN Mount Bracket - Mechanical Parts List for Installation

Item	Description	Part Number
1 & 2	DIN Mount Bracket Kit	PMLN5093

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Inserting the Remote Mount Enhanced Control Head with the DIN Mount Bracket into the DIN Frame

1. Insert the mounting frame into the DIN Mount Bracket and retain it by bending back the relevant fixing tabs. Use all 6 tabs, if necessary, to hold it in place.

NOTE

The tabs are easily bent back by twisting a large flat-bladed screwdriver into the slot behind the tabs.

For a more secure installation the top and rear of the frame should also be secured with screws.

The demount tool can be used as an aid to mounting as well as demounting.

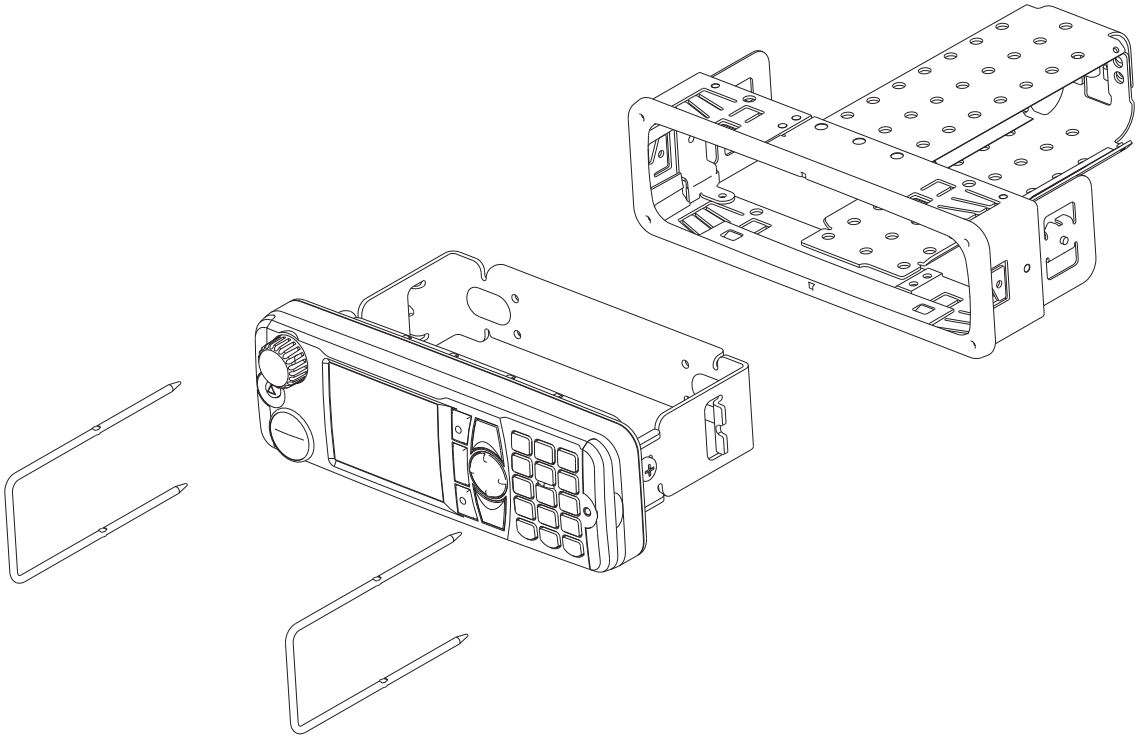

Figure 13 Mounting the Remote Mount Enhanced Control Head with the DIN Mount Bracket into the DIN Frame

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Adding Extra Connectivity to the Remote Head

The Accessories Expansion Cable (PMKN4029) allows users to have extra connectivity to accessories via the Mobile Microphone Port (MMP) and USB port.

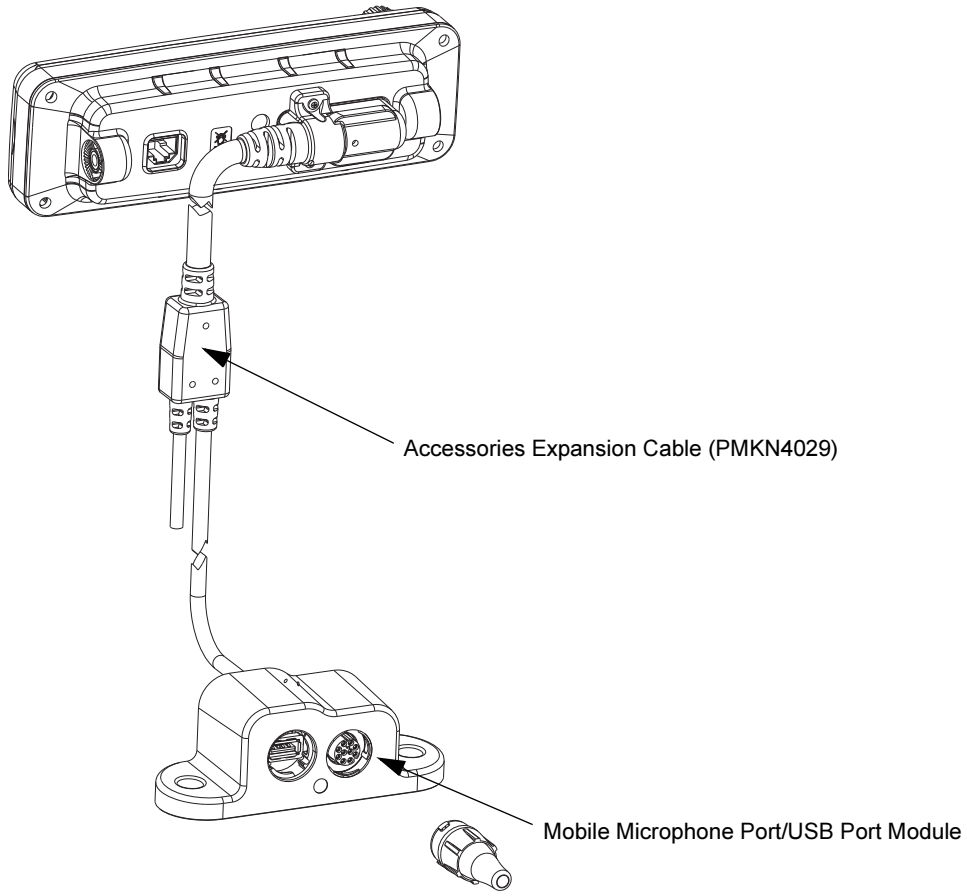

Figure 14 The Accessories Expansion Cable with the Mobile Microphone Port (MMP)/USB Port Module

Installing the Accessories Expansion Cable

1. Plug in the Accessories Expansion Cable to the subD Port of the Remote Mount Enhanced Control Head.
2. Tighten the screws at the subD connector to secure the Accessories Expansion Cable in place.
3. The Mobile Microphone Port (MMP)/USB port module can be mounted to a variety of surfaces. Tighten the two screws at both sides of the module to fix it securely in place.

***** For more information on the connector pin functions of the Accessories Expansion Cable and the Mobile Microphone Port (MMP)/USB Port Module, please see Table 16 on page 69.

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Motorcycle Mount Enhanced Control Head Installation

NOTE **Be advised, the motorcycle installation is not applicable to 260–275 MHz terminals.**

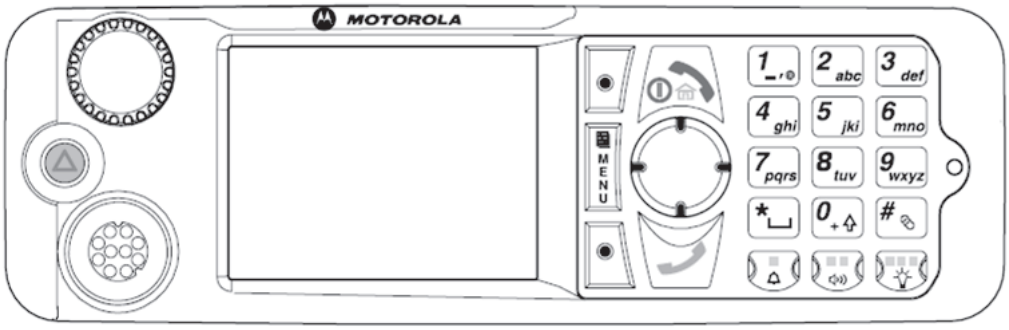

Figure 15 Motorcycle Mount Enhanced Control Head - Front Side

NOTE **The keypad labelling of the control head may vary according to the specific customer/country concerns.**

Planning

Planning is the key to fast, easy radio installation. Before a hole is drilled or a wire is run, inspect the vehicle and determine how and where you intend to mount the antenna, radio, and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating.

The installation planning should only be undertaken by persons who are competent and able to ensure that the complete installation fulfils its regulatory requirements, such as EMC (ElectroMagnetic Compatibility).

The following list of considerations should, as a minimum, be checked during installation planning:

1. The recommended place for the transceiver is to place it in the box at the back of the motorcycle.
2. Mount the Motorcycle Mount Enhanced Control Head horizontally at a position which enables the driver to view the controls and operate them easily.
3. Be sure the Motorcycle Mount Enhanced Control Head is close enough to the vehicle operator to permit easy access to operating controls.
4. It is recommended to mount the Motorcycle Mount Enhanced Control Head directly on the chassis or handle part.
5. Ensure that the units mounted in the motorcycle box are protected from dirt and moisture.
6. Verify that there is sufficient space around the units to allow air flow and removal.
7. Verify that the cable from a handlebars mounted Motorcycle Mount Enhanced Control Head and to the radio unit is long enough to allow for the handles to be turned.

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8. Verify that the antenna cable is routed in the shortest way to minimize power loss over the cable.
9. Check that the mounting surfaces are able to support the weight of the units.

NOTE

If an additional GPS antenna or a combined TETRA/GPS antenna is used, the antenna housing carries the GPS receiver. Take care not to cover the antenna housing with metal or other radio wave absorbing material.

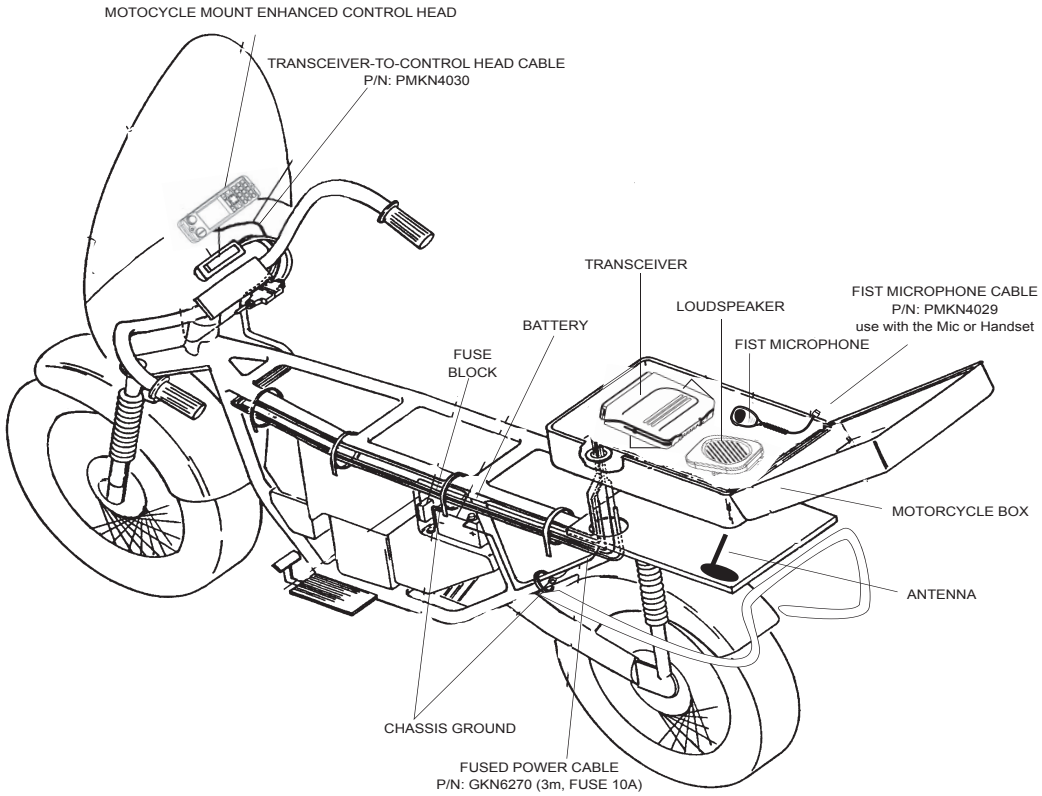

Figure 16 Motorcycle Installation

Installing the Motorcycle Mount Enhanced Control Head

1. Slide the Motorcycle Mount Enhanced Control Head onto the mounting trunnion until it snaps into place.
2. Tighten the screws at both sides of the trunnion. After a few turns, tilt the Motorcycle Mount Enhanced Control Head for an optimum view of the display. Then, complete the tightening of the screws.
3. There are two ways to mount the motorcycle trunnion, each limited to a 77 degree of allowable movement, as shown in Figure 17 and Figure 18:

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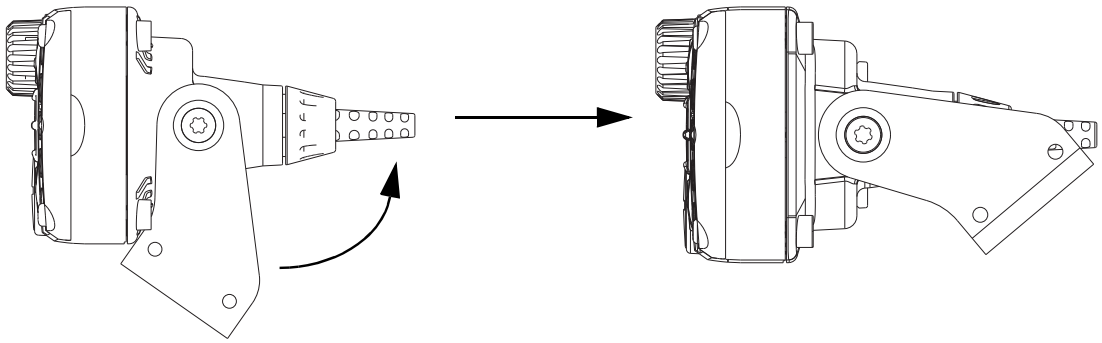

Figure 17 Upward Movement

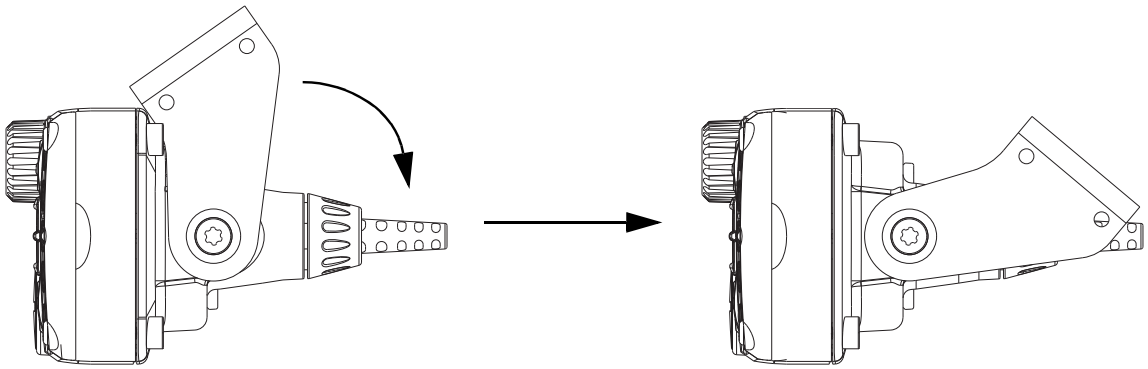

Figure 18 Downward Movement

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Mechanical Parts

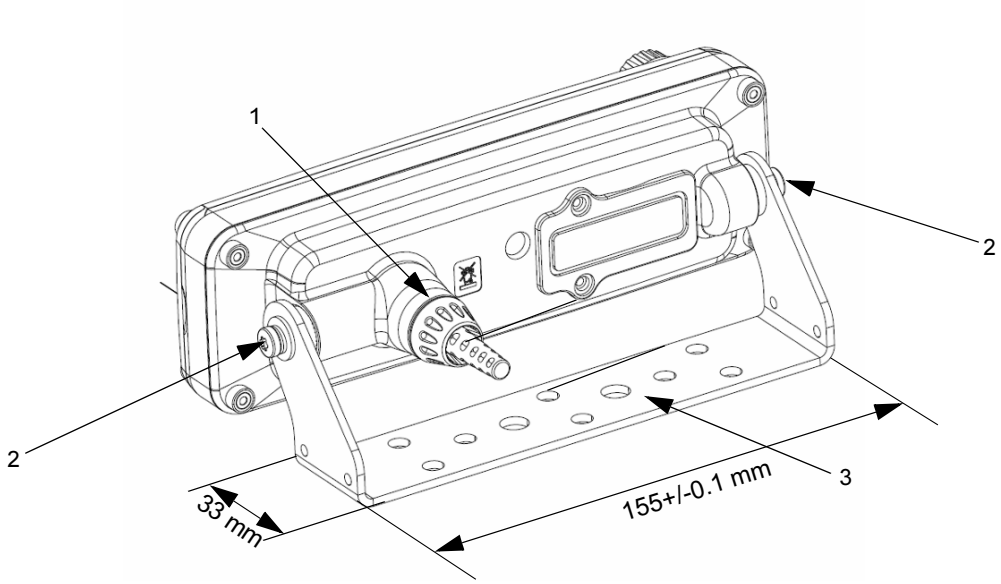

Figure 19 Motorcycle Mount Enhanced Control Head Mounted in a Trunnion

Table 7 Motorcycle Mount Enhanced Control Head - Mechanical Parts List for Installation

Item	Description	Part Number
1	Motorcycle Mount TELCO Cable	PMKN4030
2 & 3	Motorcycle Trunnion Kit	PMLN5092

Installation of the Motorcycle Mount TELCO Cable (PMKN4030)

1. Plug the TELCO connector to the TELCO socket of the Remote Head Enhanced/Data Expansion Head Enhanced connected to the transceiver.
2. Plug the other side of TELCO connector to the TELCO socket of Motorcycle Mount Enhanced Control Head.

Adding Extra Connectivity to the Motorcycle Mount Enhanced Control Head

Please see “Adding Extra Connectivity to the Remote Head” on page 44 for more information on adding extra connectivity using the Accessories Expansion Cable and the Mobile Microphone Port (MMP)/USB Port module.

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Data Expansion Head Enhanced Installation

Data Expansion Head Enhanced Radio without Control Head

The Data Expansion Head Enhanced can be used without a control head.

This configuration allows the use of the radio without any control head, allowing the radio to be powered on via the ignition switch.

The packet data/SDS via the AT commands are available from the 9-pin subD connector (PEI).

The Remote PTT can be connected via the 26-pin rear connector. Only one talkgroup is available, and that talkgroup is the first one on the CPS list.

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Data Expansion Head Enhanced with 3rd Party Control Head

The Data Expansion Head Enhanced can be used with a “virtual head” on a PC or a third party control head.

This configuration allows the controlling of the radio (Transceiver Box) with a Control Terminal (for example: Personal Computer, Laptop, Console, and so forth). In this configuration, the Control Terminal is a substitute for the Enhanced Control Head. The Control Terminal is connected to the 25-pin socket of the Data Expansion Head Enhanced via the GMKN4079 cable (see section “Connecting Cables” on page 68 for more information).

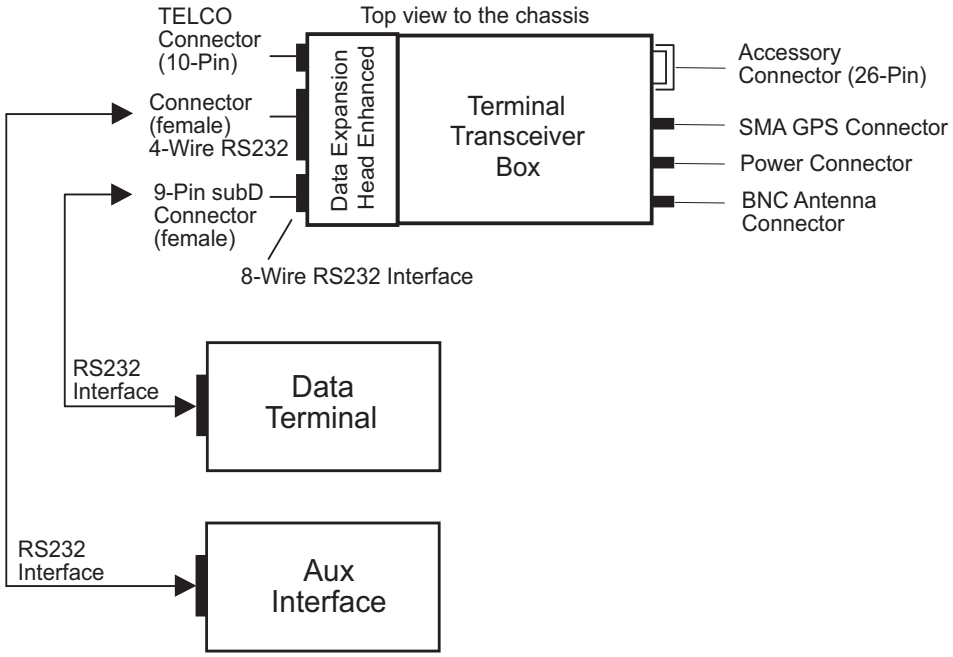

Figure 20 Configuration with Remote Control Terminal and Data Terminal

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Data Box Radio

This configuration allows the controlling of the radio (Transceiver Box) via PEI (for example: Personal Computer, Laptop, Console, and so forth) with AT Commands (recommended) or TNP1 protocol from a Control Terminal.

In this configuration, the Data Terminal is a substitute for the Enhanced Control Head. The Data Terminal is connected to either the 9-pin socket of the Data Expansion Head Enhanced via the RS232 cable or to the 26-pin accessory connector via the active data cable (see section “Connecting Cables” on page 68 for more information).

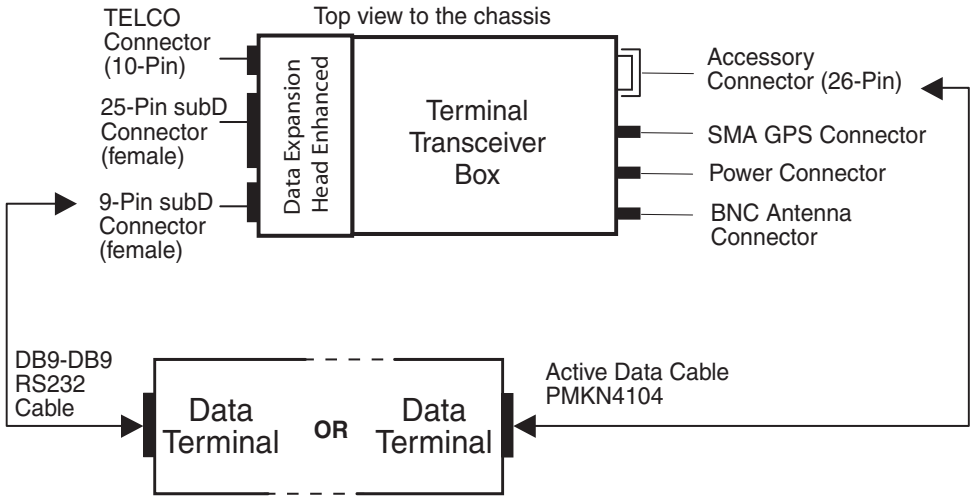

Figure 21 Data Box Radio Configuration

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Junction Box Installation

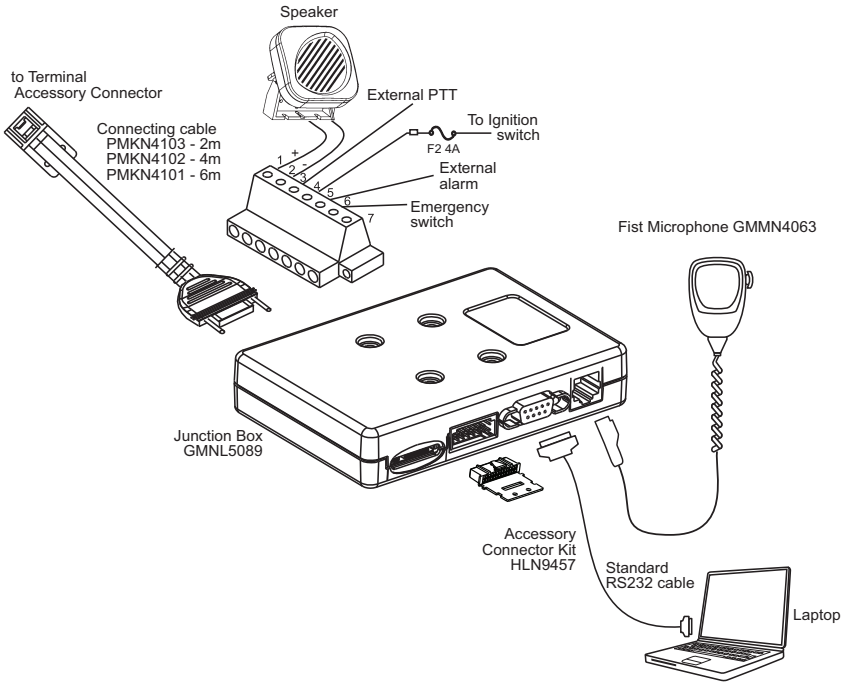

Figure 22 Remote Mount Installation with Junction Box

General

The junction box (GMLN5089) assists the easy installation for dash and remote mount configurations. It furthermore provides access to the radio for flashing and keyloading of Universal Crypto Module (UCM) encryption keys.

The junction box enables the customer adding a laptop to the remote configuration, connecting a visor microphone, various accessories or fist microphone.

Installation

The junction box can be installed horizontally and vertically. Secure the junction box by screwing the four supplied screws straight into the location as shown in the figure below. Use the connecting cable (1) for installation purposes.
Ingress Protection (IP) Code: IP30
The junction box has no connector sealing and is designed for use in dust and water protected location only.

1. Secure the junction box (GMLN5089) with the four screws supplied with kit.
2. Connect the connection cable PMKN4101 (length = 6 m), PMKN4102 (length = 4 m) or PMKN4103 (length = 2 m) from the junction box to the accessory connector on the rear side of the transceiver and fasten it with the plug-screws.
   The cable which will be used for installation purposes only must be ordered separately.
3. All other devices should be adapted as shown in Figure 22.

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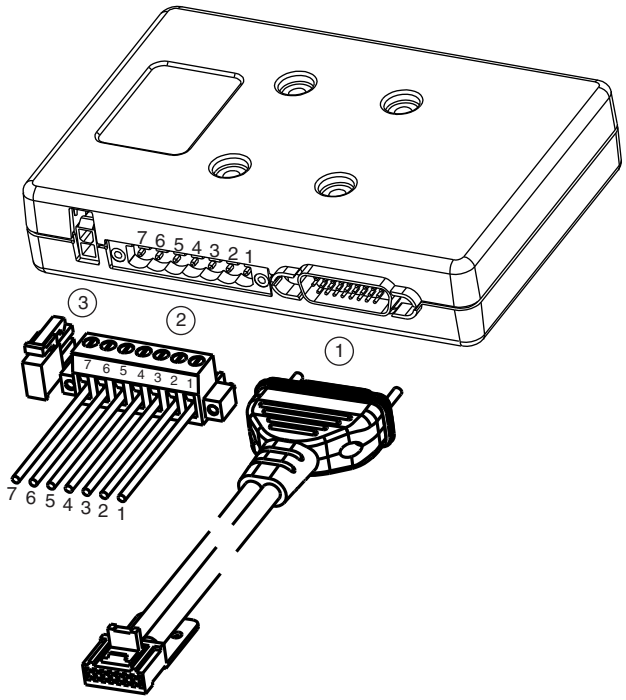
Service

The junction box PCB is not repairable. Please order a new junction box as necessary.

Connections

1. Connect all accessories to the junction box. If it is required please see “Re-crimp Procedure” on page 61to be able to connect your accessory.
2. Connect the mobile-terminal-to-Junction box cable to the junction box.
3. Connect the programming cable to the junction box (if required).



1 = Connecting cable from Junction Box to MTM5400 (rear side 26-pin accessory connector) for installation purpose only.

PMKN4101A (length 6 m)
PMKN4102A (length 4 m)
PMKN4103A (length 2 m)

2 = Connector for accessory terminal
pin 1 SPEAKER +
pin 2 SPEAKER -
pin 3 EXT_PTT
pin 4 IGNITION SENSE
pin 5 EXT_ALARM
pin 6 EMERGENCY
pin 7

3 = Connector for visor microphone

Figure 23 Connectors on the Junction Box - Front Panel

CAUTION **PIN 4: Use an adapter between the radio and the accessory connector to short the ignition to ground. Interference can cause radio to hang.**

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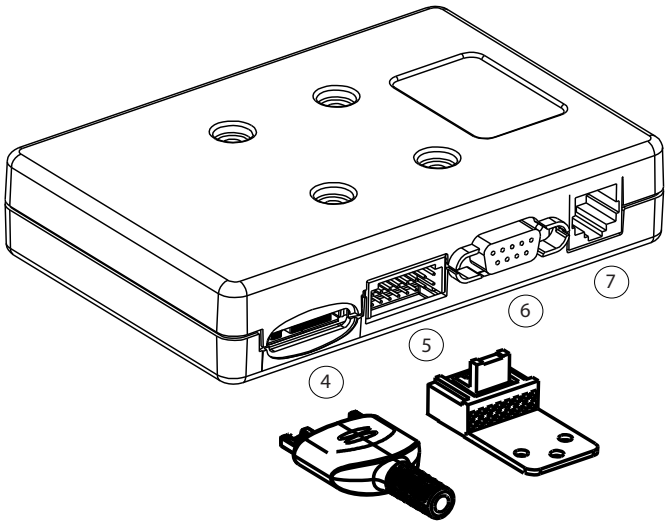


4 = Connector for programming cable FLN 9636
This is a legacy connector which currently is not supported. For programming the transciever, use PMKN4105A programming cable that is connected directly to the transciever.

5 = Connector for accessory connector kit PMKN4026

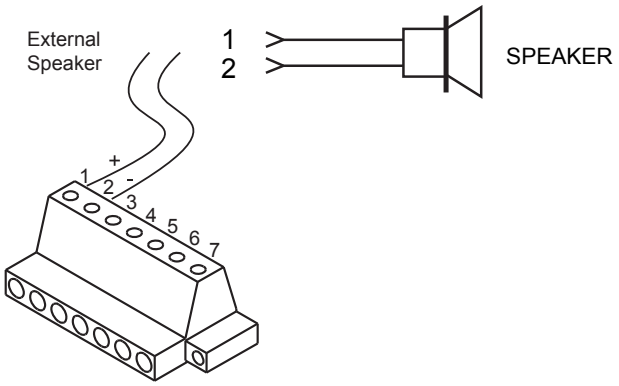
6 = Connector for adapting a laptop via RS232 cable

7 = TELCO-connector for fist microphone (GMMN4063)

Figure 24 Connectors on the Junction Box - Rear Panel

Connection Plan for the Junction Box Accessory Terminal

Connection Plan for the Speaker



JUNCTION BOX TERMINAL

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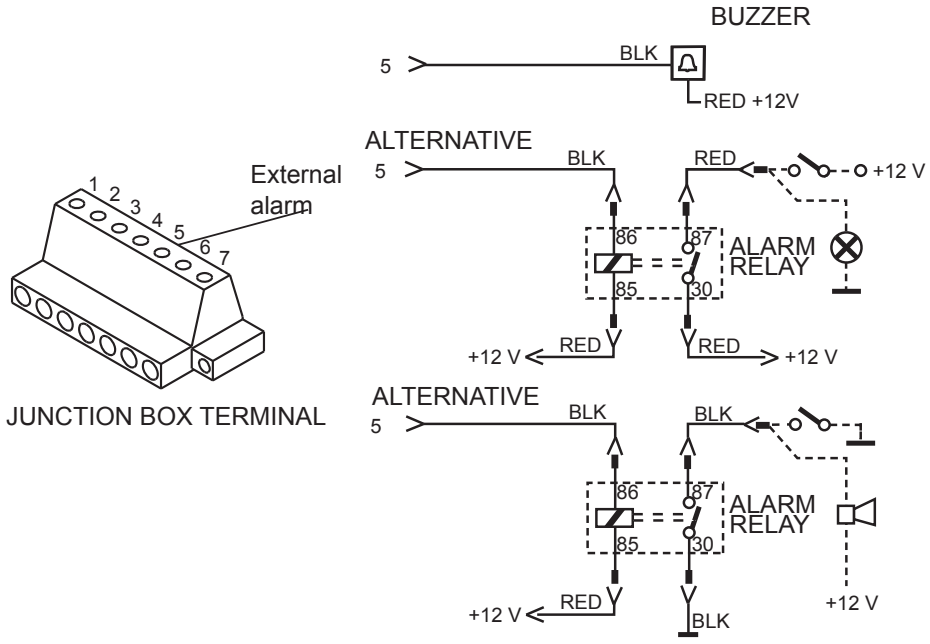
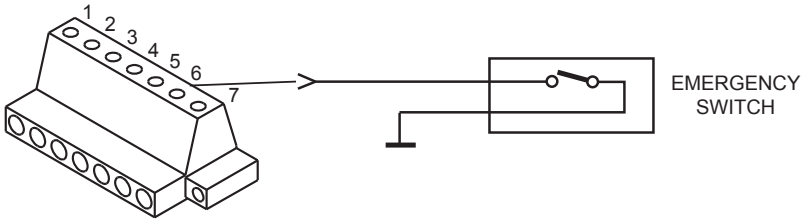
Connection Plan for the Alarm Relay



Connection Plan for the Emergency Switch



To install the cable, carry out the following steps.

1. Connect the stripped lead of the fuse holder cable only to an ignition switched terminal of the fuse block. Use the supplied terminal or any other suitable terminal.
2. Mount the fuse holder using the mounting hole, and dress wires as required.
3. Cut the thin cable to the required length, crimp the supplied red lead to the stripped lead of the thin cable, and connect it to the blue terminal of the fuse holder cable.
4. Connect the other end of the ignition sense thin cable to pin 4 of the junction box terminal.
5. Insert the provided fuse into the fuse holder and close the cover.

CAUTION **PIN 4: If the ignition line is not used, it needs to be grounded. Interference can cause radio to hang.**

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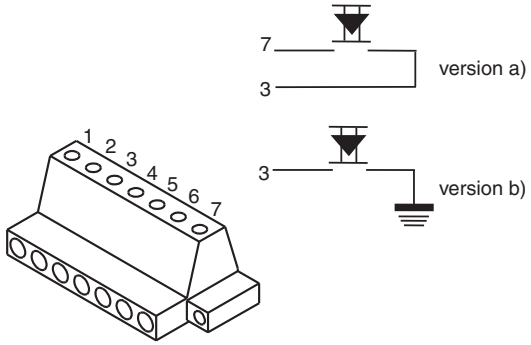
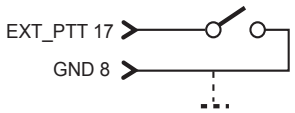
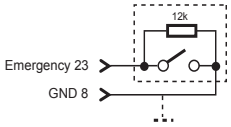
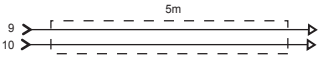
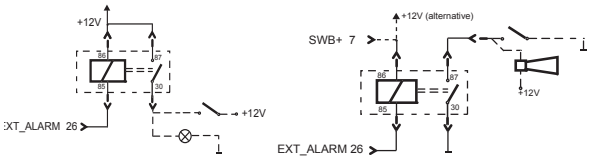
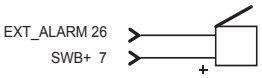
Connection Plan for External PTT



JUNCTION BOX TERMINAL

Connection Plan for Accessory Connector Kit (HLN9457)

Part Number/Description	Cable Connectivity
RSN4002A Speaker 13W **GMSN4078** Speaker 5W	
RLN4857 Push button PTT **RLN4858** Gooseneck PTT *These accessories can be used for PTT or Emergency function.*	
RLN4836 Tri-State Emergency Footswitch and Cable	
GMKN4084 Speaker Extension Cable	
GKN6272 External Alarm Relay and Cable	
GLN7282 Buzzer	

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Radios with Data Expansion Head Enhanced

To use a junction box with one of the MTM5400 mobile terminals fitted with a Data Expansion Head Enhanced, always use the 9-pin RS232 port on the Data Expansion Head Enhanced for PEI instead of the 9-pin RS232 port on the junction box (connector 6). Ensure to fit a jumper between pins 6 and 15 of the Junction Box (connector 5) for the PEI to operate correctly in this configuration.

Standard Radios without Data Expansion Head Enhanced

For standard MTM5400 mobile terminals without a Data Expansion Head Enhanced, the jumper between pins 6 and 15 of the junction box (connector 5) should be removed.

Table 8 Jumper on Accessory Connector

MTM5400 **Mobile Terminal**	**Fit Jumper Pins 6-15?**	**Use Junction Box RS232 PEI?**
With Data Expansion Head Enhanced	Yes	No Use the Data Expansion Head Enhanced 9-pin PEI instead.
Without Data Expansion Head Enhanced	No	Yes

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Connectors and Pin Assignment of the Radio

Transceiver Rear Side - Pin Function

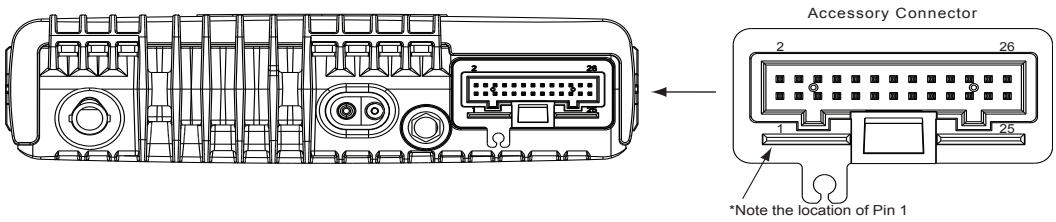

Figure 25 Location of Accessory Connector - Rear Side

This section gives a description of the Accessory Connector pin functions.

CAUTION **The accessory connections shown are not compatible to some other models of Motorola radios. Check the appropriate accessory or technical manual for further information.**

Table 9 26-Pin Accessory Connector

Pin	Function	Description
1	UART1_TXD / USBx_D+	USB 1.1 – Default Host RS232 or UART2 – Alternative Setting
2	UART1_RXD / USBx_D-	
3	UART1_RTS / USBx_VBUS	
4	GND_USBx	
5	1-WIRE	1-Wire standard port (pulled via 2K2 to 5V inside U600)
6	KEYFAIL / FLASH	Key load (pulled via 10K to 5V) Flash input (>10V will trigger Flash mode)
7	SWB +	A+ voltage (limited to 14V) with 1A current limitation
8	GND_MAIN	Main and power ground
9	SPEAKER-	Loudspeaker (PA) output – (NOT TO BE GROUNDED!)
10	SPEAKER+	Loudspeaker (PA) output +
11	TX_AUDIO	TX audio output
12	GND_ANA	Main audio ground
13	MIC1 / EXT_MIC	Ext mic input / MIC1 for noise cancelling dual mic input

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Table 9 26-Pin Accessory Connector

Pin	Function	Description
14	RX_AUDIO	RX audio output
15	MIC2	MIC2 for noise cancelling dual mic input
16	GND_MIC	Ground (for MIC)
17	EXTERNAL_PTT	PTT input (pulled via 4K7 to 5V)
18	UART2_DTR / USBy_ID	RS232 or UART1 / UART2 DTR / 2nd USB2.0 (OTG) ID
19	HOOK_PA_EN	HOOK_PA_EN input (or programmable 5V GPIO)
20	UART2_TXD / USBy_TX	RS232 or UART2 TXD / 2nd USB2.0 (OTG) D+
21	UART2_RTS / USBy_VBUS	RS232 or UART2 RTS / 2nd USB2.0 (OTG) VBUS – 100mA
22	UART2_RXD / USBy_RX	RS232 or UART2 RXD / 2nd USB2.0 (OTG) D-
23	EMERGENCY	Emergency Input (Pulled via 24K9 to A+) – Pull low to power on
24	UART_CTS	RS232 or UART1 / UART2 CTS input
25	IGNITION	Ignition input (through series 15K) – Pull > 5V to power on
26	EXTERNAL ALARM	External Alarm input (Pulled via 4K7 to A+)

CAUTION

PIN 25: If the ignition line is not used, it needs to be grounded for example connected to pin 8. Interference can cause radio to hang.

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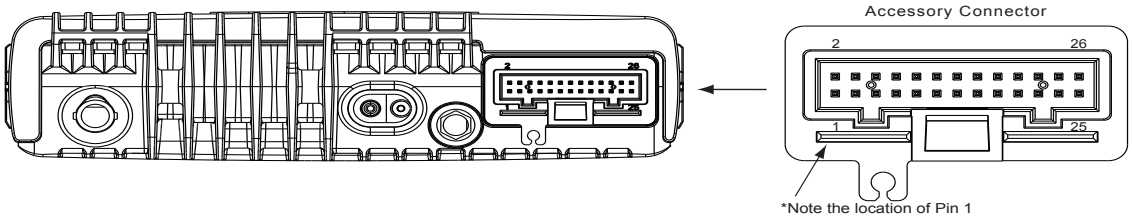
Accessory Connection Plan

CAUTION

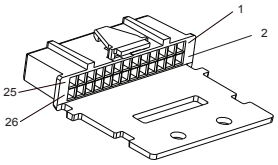
The accessory connections shown are not compatible to some other models of Motorola radios. Check the appropriate accessory or technical manual for further information. Ensure correct position of the accessory connector.

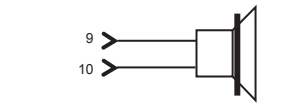


26-pin Accessory Connector

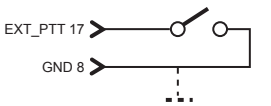
The 26-pin connector, Part Number: 1516174H01 (delivered with the accessory connector kit, Part Number: PMLN5072A) plugs into the 26-pin accessory connector on the terminal. The four outside pins are not connected, see grey square at figure above.

(Alternatively, a 26-pin connector can be used as well, Part Number: 1586184B01).

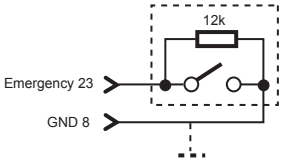




RSN4002 Speaker 13W
RSN4004 Speaker 5W

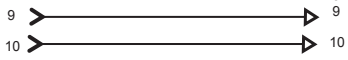


RLN4857 Pushbutton w/Remote PTT
RLN4858 Gooseneck PTT



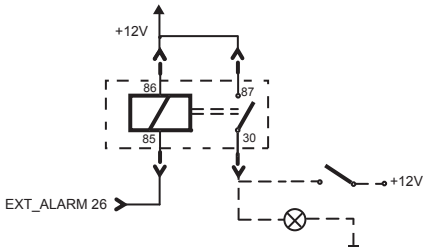
RLN4836 Tri-state Emergency Footswitch and Cable

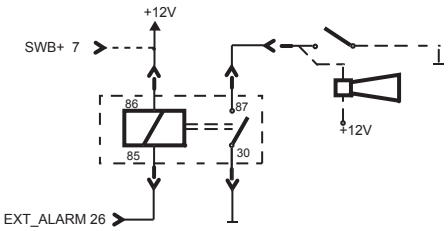
PMKN4119 Speaker Extension Cable



PMLN5072A Accessory connector kit containing:
Seal, Part No 3202606Y02
Crimp Contact, Part No 2984249N01

GKN6272 External Alarm, Relay and Cable





GLN7282 Buzzer

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Re-crimp Procedure

In order to use accessories (RLN4858 and GKN6272) with the rear connector of the radio, please follow the re-crimp procedure using the crimp pins provided with PMLN5072 connector kit.

NOTE

These accessories do not require to be re-crimped when used with the Junction Box GMLN5089.

1. Cut and remove nickel plated pins from wire.
2. Strip the insulation from the end of the wires (2mm to 4mm).
3. Place the new gold plated crimp pin (from the PMLN5072 kit) on the gauge slot on the crimp tool.
4. Insert wire into wire slot of the crimp pin.
5. Apply pressure to the crimp tool handle, until wire is crimped by the pin.

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Connectors and Pin Assignment of Data Expansion Head Enhanced and Remote Head Enhanced

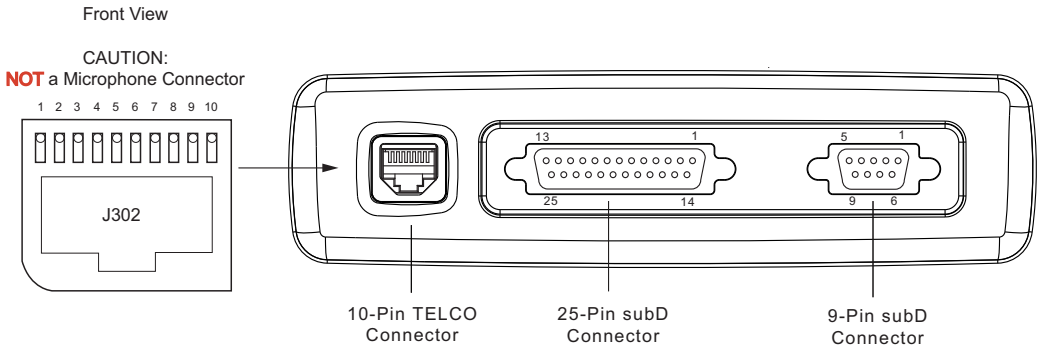

Figure 26 Data Expansion Head Enhanced - Front View and Connector Location

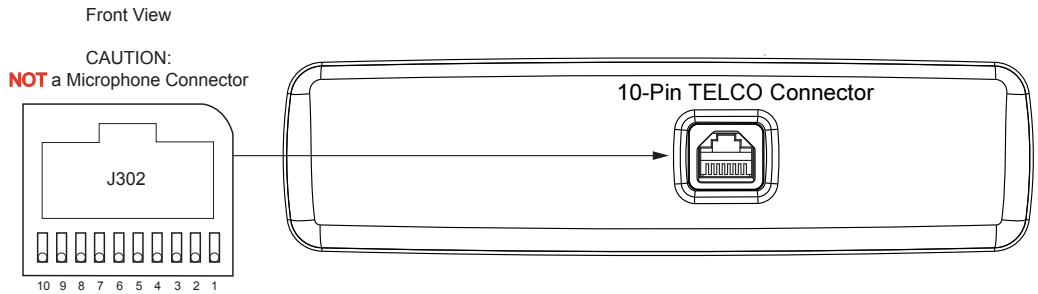

Figure 27 Remote Head Enhanced - Front View and Connector Location

10-Pin TELCO Connector

Data Expansion Head Enhanced:

a) The 10-pin TELCO connector can be used to connect a customized adapter, for example, for connecting the helmet including microphone/earpiece (non-Motorola accessory) or an external PTT. The customized adapter will be connected via the cable RKN4077.

b) The 10-pin TELCO connector can be used to connect a remote mount Enhanced Control Head.

DO NOT connect any other accessories (for example, microphone). This might result in malfunctioning hardware failure.

Remote Head Enhanced:

The 10-pin TELCO connector of the Remote Head Enhanced can be used in the same way as described on b).

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Table 10 10-Pin TELCO Connector

Pin	Function	Description
1	Audio +	Balanced Audio + (Bidirectional)
2	Not Connected	
3	BUS+	This is used for communication between the radio and an Enhanced Control Head.
4	Audio-	Balanced Audio - (Bidirectional)
5	Not Connected	
6	Ground	Ground
7	Radio On/Off Control	This is the Enhanced Control Head service request input. A level of 5 volts indicates that the Enhanced Control Head needs to communicate with the radio. In addition it switches on the radio's voltage regulators. The idle state is a level below 0.6V.
8	SCI_TX	This if for communication between the radio and the Enhanced Control Head.
9	FLT_A+	This voltage is at battery voltage level and is available as long as the radio is connected to the supply voltage. The maximum current is 300mA. A fuse in the radio prevents further circuit damage in case of shorting this pin to ground.
10	Analog Ground	Analog Ground

25-Pin subD Connector

Data Expansion Head Enhanced:

Table 11 25-Pin subD Connector

Pin	Function	Description
1	GND	Ground
2	RS232_SCI_TX	Transceive data (RS232 line with RS232 level)
3	RS232_SCI_RX	Receive data (RS232 line with RS232 level)
4	RS232_RTS	Request to Send (RS232 line with RS232 level)
5	RS232_CTS	Clear to Send (RS232 line with RS232 level)
6	FLT_A+	Filtered unswitched U_B+ / 200mA
7	Signal_GND	Ground for RS232
9	NC	Not Connected
10	NC	Not Connected
11	NC	Not Connected
12	SW_B+	Switched U_B +/100mA
13		

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Table 11 25-Pin subD Connector

Pin	Function	Description
14	ON_OFF_CONTROL / FLASH_MODE	• Switch into flash mode (connect pin14 with 6) • On/Off control for Std. Control Head
15		•
16	INT_MIC	Microphone analogue input of 80mV_{RMS}, 600ohm impedance, 9$V_{=}$
17		
18	NC	Not Connected
19	GROUND	Ground
20	IGNITION	Connecting this pin to the ignition line of the vehicle that will automatically turn on the radio if ignition of the vehicle is turned on. High active
21	ON_OFF_GND	This is On/Off control for the old Control Head “J” (MTM300 Control Head)
22	EXPANSION_PTT	Expansion PTT, works together with INT_MIC
23		
24	HANDSET_AUDIO	Handset audio to earpiece Earpiece impedance has to be > 200 Ohm
25	NC	Not Connected

9-Pin subD Connector

The pin assignment of this 9-pin subD connector will follow the requirements of an RS232 standard interface with RS232 voltage level. The cable (see section “Connecting Cables” on page 68) which has to be used is a standardized serial interface cable which allows to connect a data device with an RS232 Interface such as for example PC, Laptop, Console.

Table 12 9-Pin subD Connector

Pin	Function	Description	PC Direction
1	DCD	Data Carrier Detect	Input
2	RXD	Received Data	Serial IN
3	TXD	Transmitted Data	Serial OUT
4	DTR	Data Terminal Ready	Output
5	GND	Ground	Output
6	DSR	Data Set Ready	Input
7	RTS	Request to Send	Output
8	CTS	Clear to Send	Input
9	RI	Ring Indicator	Input

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Connector and Pin Assignment of the Enhanced Control Head

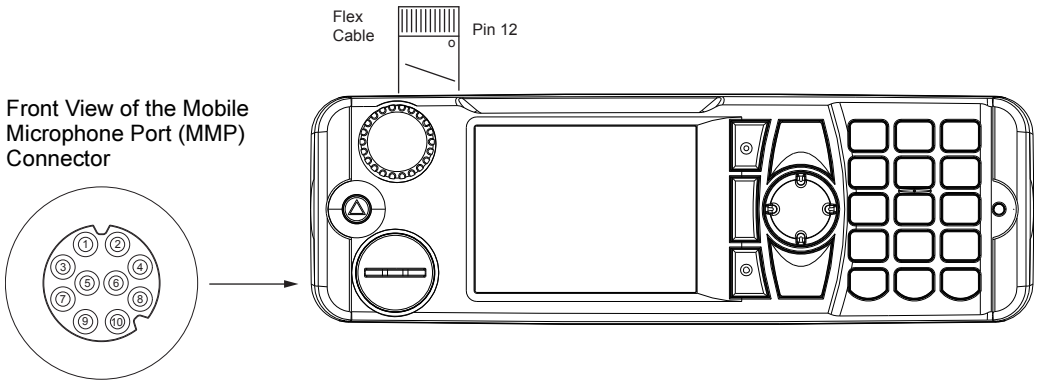

Figure 28 View of the Enhanced Control Head's Mobile Microphone Port Connector and Flex Cable

NOTE **The keypad labelling of the control head may vary according to the specific customer/country concerns.**

Table 13 10-Pin Mobile Microphone Port (MMP) Connector

Mobile Microphone Port Pin		Default Functions	Alternative Functions	USB Functions	RS232 Functions
1	1-WIRE	1-WIRE	1-WIRE	1-WIRE	1-WIRE
2	GPIO_3	PTT	GP Input or Output	GP Input or Output	RS-232-RTS
3	SPEAKER	SPEAKER	SPEAKER	SPEAKER	SPEAKER
4	GPIO_2	GPIO_2 INPUT	GP Input or Output	DATA -	RS-232-RXD
5	GND	GND	GND	GND	GND
6	OPT 5V	HIGH Impedance	OPT 5V	VBUS	OPT 5V
7	MIC +	MIC +	MIC +	MIC +	MIC +
8	GPIO_1	GPIO_1 INPUT	GP Input or Output	DATA +	RS-232-TXD
9	GPIO_4	HOOK	GP Input or Output	GP Input or Output	RS-232-CTS
10	GPIO_0	GPIO_0 INPUT	GP Input or Output, PWR ON	GP Input or Output, PWR ON	GP Input or Output, PWR ON

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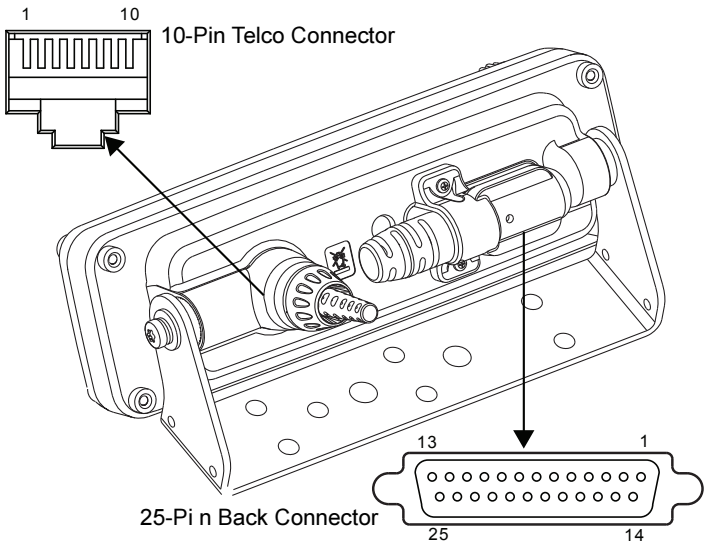

Figure 29 View of the Enhanced Control Head's rear connectors

Table 14 10-Pin Telco Connector

Telco Connector Pin	Function	Description
1	AUDIO +	Balanced Audio + (Bidirectional)
2	NC	Not Connected
3	BUS +	This is used for communication between the radio and an Enhanced Control Head.
4	AUDIO -	Balanced Audio - (Bidirectional)
5	NC	Not Connected
6	GND	Ground
7	Radio On/Off Control	This is the Enhanced Control Head service request input. A level of 5 volts indicates that the Enhanced Control Head needs to communicate with the radio. In addition it switches on the radio's voltage regulators. The idle state is a level below 0.6V.
8	SCI_TX	This if for communication between the radio and the Enhanced Control Head.
9	FLT_A +	This voltage is at battery voltage level and is available as long as the radio is connected to the supply voltage. The maximum current is 300mA. A fuse in the radio prevents further circuit damage in case of shorting this pin to ground.
10	Analog Ground	Analog Ground

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Table 15 25-Pin Back Connector

Back Connector Pin	Function	Description	Default
1	GPIO_9	GPIO	Output: Active for duration of call (car radio mute)
2	GPIO_6	GPIO	PTT Input, TX audio from MIC_REAR_2
3	GPIO_8	GPIO	Disabled
4	GPIO_3	GCAI PIN 2	PTT Input, TX audio from MIC_REAR_1
5	VBUS_1B	GCAI PIN 6: 5V Supply	Disabled
6	REAR_D -	GCAI PIN 4: USB D -, GPIO_2 (Shared with the front MMP)	Disabled
7	REAR_D +	GCAI PIN 8: USB D +, GPIO_1 (Shared with the front MMP)	Disabled
8	GPIO_0	GCAI PIN 10: GPIO	Input: GCAI detection / Select Line
9	VBUS_2	Second USB 5 V Supply	Disabled
10	TX	4-wire RS232 TX	
11	RX	4-wire RS232 RX	
12	MIC_REAR_2	Second Rear Microphone	Disabled
13	GND	Ground	
14	GPIO_5	GPIO	Disabled
15	GPI_7	4-Level Analogue Input	Enabled
16	1_WIRE	GCAI PIN 1: Bi-directional Serial Bus	Disabled
17	HANDSET	GCAI PIN 3: Handset Audio Output	Parallel to front GCAI
18	GND	GCAI PIN 5: Ground	
19	MIC_REAR_1	GCAI PIN 7: Microphone Input	Disabled
20	GPIO_4	GCAI PIN 9: GPIO	Hook Input
21	USB_D +	Second USB D +	
22	USB_D -	Second USB D -	
23	RTS	4-wire RS232 RTS	
24	CTS	4-wire RS232 CTS	
25	PWR_ON	Enhanced Control Head Power On Input	

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Connecting Cables

Motorcycle Mount Enhanced Control Head-to-Remote Head Enhanced/Data Expansion Head Enhanced (Motorcycle Mount TELCO Cable)

Part Number: PMKN4030
Length: 2.3 m (7.55 feet)

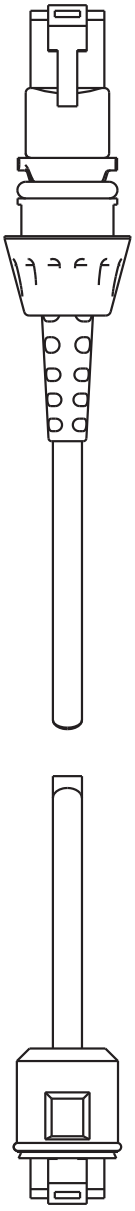

Figure 30 Connecting Cable - Motorcycle Mount TELCO Cable

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Remote Mount Enhanced Control Head/Motorcycle Mount Enhanced Control Head-to-Accessories (Accessories Expansion Cable)

Part Number: PMKN4029

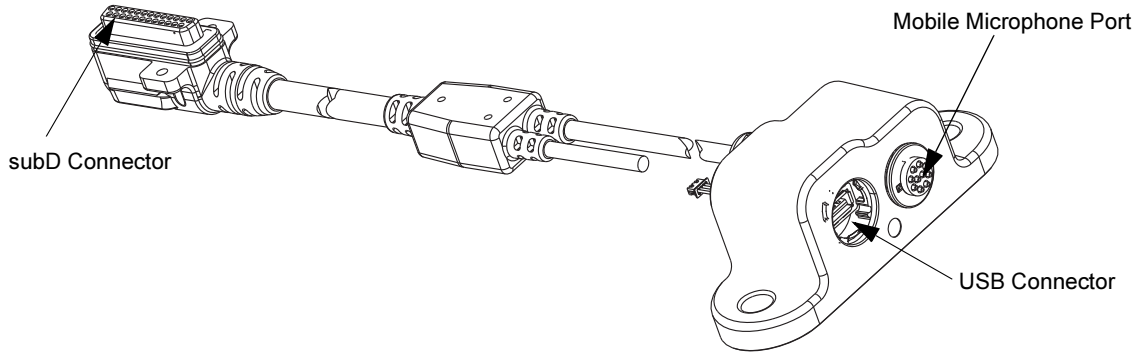

Figure 31 Connecting Cable - Accessories Expansion Cable

Table 16 Accessories Expansion Cable, Connector Pin Function

USB A JACK	Signal	subD 25 Pos
1	VBUS	9
2	D-	22
3	D+	21
4	Ground	18
Mobile Microphone Port (MMP)		
1	1_WIRE	16
2	GPIO_3 / OTG-ID / RTSc (PTT)	4
3	Speaker to Headset	17
4	GPIO_2 / D- / RxDc	6
5	GND (Ground)	-
6	Opt_5V / VBUS	5
7	Mic+	19
8	GPIO_1 / D+ / TxDc	7
9	GPIO_4 / CTSc / Keyfail (HOOK)	20
10	GPIO_0 / Pwr On	8
Customised Wire Color		
BROWN / BLACK	GPIO_9	1
ORANGE / BLACK	GPIO_6	2
YELLOW / BLACK	GPIO_8	3
LIGHT BLUE	GPIO_2	6
TURQUOISE	GPIO_1	7
GREEN / BLACK	TX	10
BLUE / BLACK	RX	11
GRAY / BLACK	MIC_2	12
BLUE	Ground	13
PINK / BLACK	GPIO_5	14
BLACK / WHITE	GPI_7	15

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USB A JACK	Signal	subD 25 Pos
BROWN / WHITE	RTS	23
RED / WHITE	CTS	24
ORANGE / WHITE	Power On	25
RED / BLACK	Headset	17
YELLOW / WHITE	Ground	-

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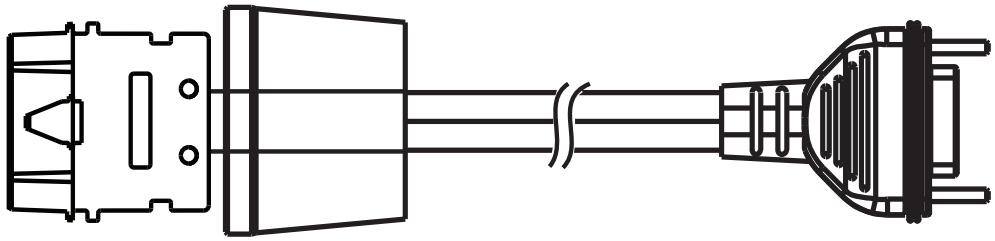
Radio-to-Junction Box

Part Number: PMKN4101
Length: 6 m (19.69 feet)



TERMINAL ACCESSORY CONNECTOR
26-Pin AMP

Pin	From (Signal Name)	Wire Gage	Wire Colour
1	USB_D+		
2	USB_D-		
3	USB_VBUS		
4	GND (USB)		
5	1 WIRE APM		
6	KEYFAIL/FLASH	26	GREY
7	SWB+	20	RED
8	GND (PWR, GPIO, VIP)	20	WHITE
9	SPEAKER-	20	BLUE
10	SPEAKER+	20	BROWN
11	TX_AUDIO	26	TAN
12	AN_GND		DRAIN X2
13	MIC1	26	RED
14	RX_AUDIO	26	WHITE/BLACK
15	MIC2		
16	GND (MIC)		
17	EXT_PTT	26	YELLOW/BLACK
18	SCI_DTR	26	GREEN/WHITE
19	HOOK/AUDIO PA	26	BLUE/YELLOW
20	SCI_TXD	26	GREEN
22	SCI_RXD	26	VIOLET
21	RS232_RTS	26	ORANGE
24	RS232_CTS	26	RED
23	EMERGENCY	26	GREEN/BLACK
25	IGNITION	26	PINK
26	EXT_ALARM	26	BLUE/WHITE

TWISTED PAIR
SHIELDED
SHIELDED
TWISTED PAIR
TWISTED PAIR

JUNCTION BOX CONNECTOR
20-Pin subD

Pin	To (Signal Name)
19	KEYFAIL/FLASH
6	SWB+
4	D_GND
3	SPKR-
1	SPKR+
5	TX_AUDIO
9	AUDIO_GND
11	EXT_MIC
2	RX_AUDIO
22	EXT_PTT
16	DTR
7	HOOK
8	AUDIO_PA_ENA
13	RX (UART TX)
23	TX (UART RX)
18	RTS
14	CTS
21	EMERGENCY
15	IGNITION
20	EXT_ALARM

Figure 32 Connecting Cable - Radio-to-Junction Box

NOTE **The keypad labelling of the control head may vary according to the specific customer/country concerns.**

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Data Expansion Head Enhanced Radio-to-Data Device

This is a standardized RS232 cable (will not be provided by Motorola). Use the 9-pin socket on the front side of the Data Expansion Head Enhanced Radio to connect this cable with the data device.

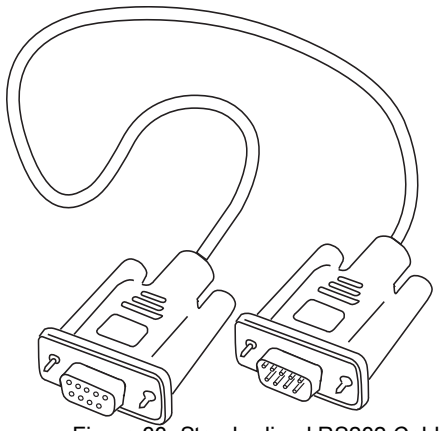

Figure 33 Standardized RS232 Cable

NOTE

The Data Expansion Head Enhanced has a protection grade of IP54.
To maintain IP54 sealing when connecting an RS232 data cable make sure to use an IP54 specified cable (example: ROLINE AT-Modem cable ST-BU 1.8m order no. 11.01.4518).

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Data Expansion Head Enhanced Radio-to-Fist Microphone

The GMKN4072 Connecting Cable replaces the existing coiled cord cable of the fist microphone (Motorola P/N: GMMN4063).

NOTE

The GMKN4072 originally is terminated with a 20-pin connector. Use the PMLN5072 accessory connector kit to re-crimp it.

Operation

The crimped wires of the cable have to be connected into the 26-pin Accessory Connector (delivered with speaker RSN4002A) and than plugged into the 26-pin connector on the rear side of the radio. The other end has a connector which fits into the fist microphone's housing.

Making Connections

First connect the exposed four wires to the 26-pin Accessory Connector as shown in Figure 1 and then plug the connector block into the 26-pin accessory socket on the rear side of the radio. The connector block plugs into the 26-pin accessory connector (four outside pins do not connect).

Removing the Existing Coiled Cord Cable

1. Rotate the locking collar at the base of the microphone in a counterclockwise direction until it stops.
2. Pull the cord out and away from the base of the of the microphone.

Install the new coiled cord GMKN4072 in a reverse order of removal.

Part Number: GMKN4072
Length: 65 cm (2.2 feet)

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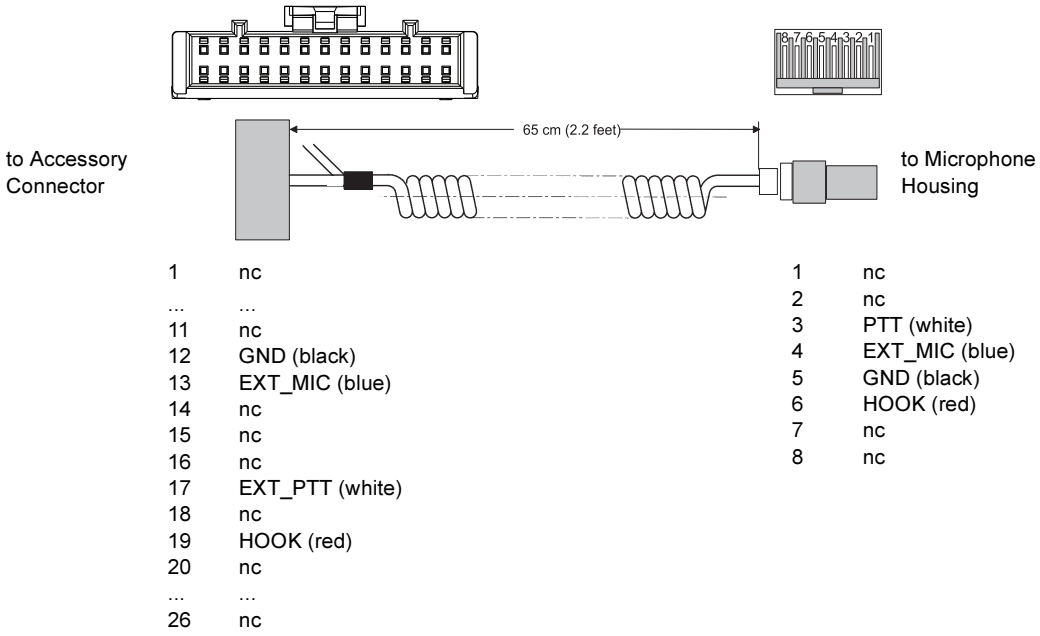

Figure 34 Pin Assignment of Cable from Accessory Connector to Microphone Housing

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Radio-to-Data Device: Active Data Cable

The PMKN4104 Active Data Cable provides a 5-wire RS232 interface (for example, RxD, TxD, CTS, RTS, DTR) between a computer and a mobile radio. The cable has to be connected to the 26-pin Accessory Connector on the rear side of the radio and into the 9-pin connector of a Data Device (for example, PC, Laptop, console).
The PMKN4104 Active Data Cable is not repairable. Order a replacement cable as necessary.

Length: 2.0 m (6.56 feet)

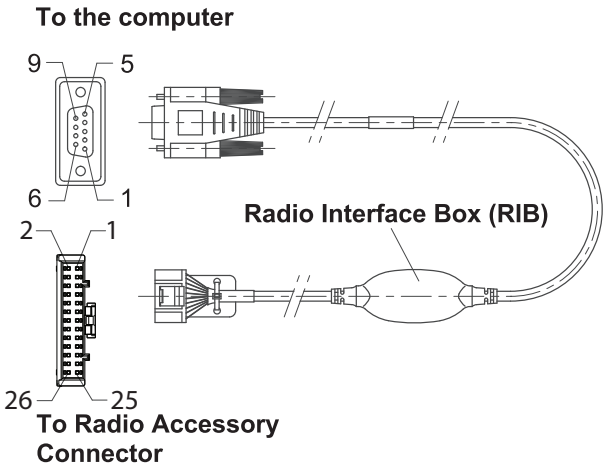

Figure 35 Active Data Cable PMKN4104

Cable Connectivity

Table 17 Pin Assignment - Active Data Cable PMKN4104

9-Pin Connector	Function	26-Pin Connector	Function
1	DCD	1	GND
2	RXD	2	TXD
3	TXD	3	RXD
4	DTR	4	RST
5	GND	5	SW+
6	DSR	6	CTS
7	RTS	7	DCD
8	CTS	8	RI
9	RI	9	DTR
		10	DSR
		11	GND
		12	X
		13	JTAF
		14	GND
		15	Y

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Vehicle Antenna Installation

Mobile Radio Operation and EME Exposure

To assure optimal radio performance and that human exposure to radio frequency electromagnetic energy is within the guidelines referenced in this document, transmit *only* when people inside and outside the vehicle are at least the minimum distance away from a properly installed, externally-mounted antenna.The table below lists the minimum distance for several different ranges of rated radio power.

Table 18 Rated Power and Distance

Mobile Radio Rated Power (see Note below)	Minimum Lateral Distance from Vehicle Body
Less than 7 Watts	20 Centimetres (8 inches)
7 to 15 Watts	30 Centimetres (1 Foot)
16 to 39 Watts	60 Centimetres (2 Feet)
40 to 110 Watts	90 Centimetres (3 Feet)

NOTE

If you are not sure of the rated power of your radio, contact your Motorola representative or dealer and supply the radio model number found on the radio model label. If you cannot determine the rated power out, then assure 90 cm (3 feet) separation from the body of the vehicle.

Selecting an Antenna Site

1. Install the vehicle antenna external to the vehicle and in accordance with:
   a. **The requirements of the antenna manufacturer/supplier**
   b. **The requirements of the vehicle manufacturer**
2. The best mounting location for the antenna is in the centre of a large, flat conductive surface. In almost all vehicles, mounting the antenna in the centre of the roof will satisfy these requirements. A good alternate location is in the centre of the trunk lid. If you use the trunk lid, ensure that the trunk lid is grounded by connecting grounding straps between the trunk lid and the vehicle chassis.
3. Ensure the antenna cable can be easily routed to the radio. Ensure that the antenna cable is routed separately and not in parallel to any other vehicle wiring or mobile radio cable wiring.

CAUTION

It is recommended to mount the antenna outside the vehicle. Also make sure your power cable is not placed with the antenna in parallel. Interference can cause radio to hang.

4. Check the antenna location for any electrical interference according to vehicle manufacturer requirements.
5. Make sure the mobile radio antenna is installed at least 30 centimeters (1 foot) away from any other antenna on the vehicle.

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NOTE **Any two metal pieces rubbing against each other (such as seat springs, shift levers, trunk and hood lids, exhaust pipes, and so forth) in close proximity to the antenna can cause severe receiver interference.**

6. The MTM5400 mobile terminal has the option of a GPS board. If a GPS or combined TETRA/GPS antenna is used, make sure that the antenna has a clear view to the sky and that the antenna base which carries the GPS receiver is not covered with any metallic or radio frequency absorbing material.

Antenna Installation Procedure

1. Mount the antenna according to the instructions provided with the antenna kit. Run the coaxial cable to the radio mounting location. If necessary, cut off the excess cable and install the cable connector.
2. Connect the antenna cable connector to the radio antenna connector on the rear of the radio.
3. If applicable, connect the GPS antenna to the GPS antenna connector PMKN4114 on the rear side of the radio.

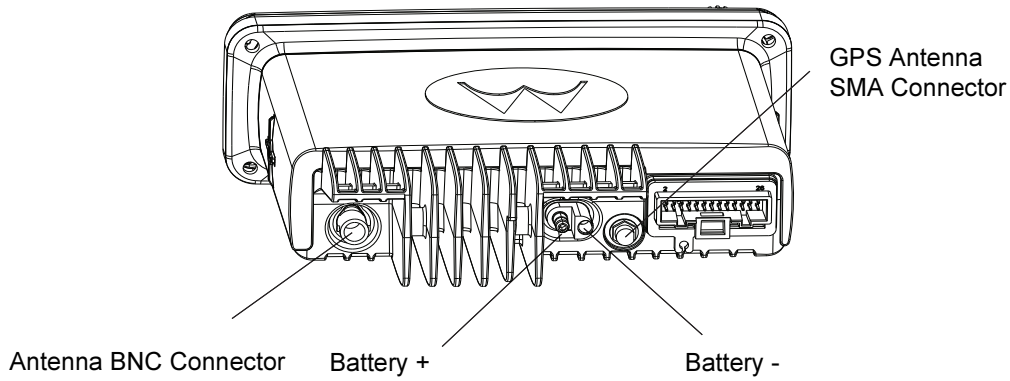

Figure 36 Connections to the rear side of the Radio

Completing the Installation

1. Mount the microphone clip to a convenient spot near your radio.
2. If your microphone has a telephone-type connector at the end of its cord, plug this connector into the 10-pin TELCO connector of your Junction Box.

CAUTION **DO NOT use the 10-pin TELCO connector of Data Expansion Head Enhanced or Remote Head Enhanced to plug in a microphone.**

3. To complete your radio installation, plug the power cable into the radio power connector.

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External Speaker Installation

1. Remove the speaker from the trunnion bracket by loosening the two wing screws.
2. Choose a place to mount the speaker. When mounting the trunnion on the transmission hump, be careful that the transmission housing is not affected.
3. Use the trunnion bracket as a template to mark the positions of the mounting holes.
4. Centre-punch the spots you marked and drill a 4 mm (5/32-inch) diameter hole at each location.
5. Mount the trunnion bracket with the screws supplied (see Figure 37).
6. Insert the speaker into the trunnion bracket and tighten the two wing screws.
7. Insert the external speaker accessory plug into the accessory connector of the radio.

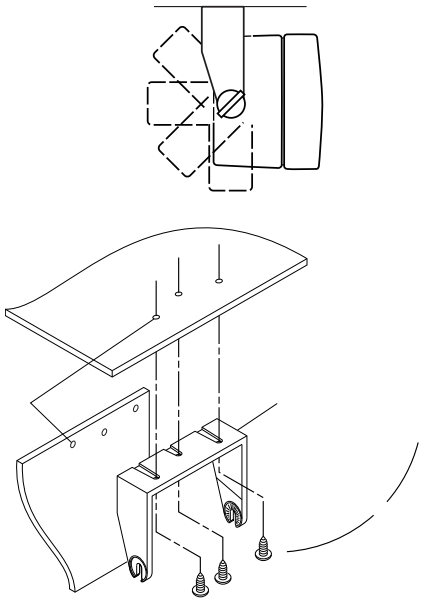

Figure 37 Mounting the Speaker under the Dashboard

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APPENDIX

Product Specific Information for Digital Terminals Type MT953C

This section gives the Service Personnel an overview about product specific notes. This is necessary to take special precautions to avoid the introduction of hazards when operating, installing, servicing or storing equipment. This terminal meets the applicable safety standards if it is used as described. All operating and safety instructions are to be followed carefully.

Equipment Electrical Ratings

Rated Voltage: 12 Volt DC

Rated Voltage Range: 10.8 to 15.6 V DC

Rated Current:

MT953C (380-430 MHz): 4 Amps @ 10 Watts RF power
Please be aware when planning the installation that there is a current consumption of approx. 4.5A during PTT and even 30mA when terminal is switched off.

Transmitter Frequency Range:
TMO: 380-430 MHz (MT953C)
DMO: 380-430 MHz (MT953C)

Receiver Frequency Range:
380-430 MHz (MT953C)

Normal Load Conditions

Rated RF Power: 10 Watts

Rated Audio Power: 10 Watts @ 4 Ohms; 6 Watts @ 8 Ohms

Antenna Impedance: 50 Ohms

Operating Temp. Range: -30 to +60°C

Operating Time: Continuous/Intermittent

In general, the terminal transmit and receive time (operating cycle time) is determined by the communication system. On overload, respectively on extensive use beyond the systems specifications at high ambient temperatures, the terminal is protected by its thermal control, which cuts down the RF output power, thus reducing the terminal coverage range.

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Fuse Identification

In case of blown fuses during the installation replace ONLY with those of identical value.
Never insert ones of different values.

Fuse for Power Cable GKN6270/GKN6274: 10 A (Motorola Part Number: 6500139767)

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